New finds at a previously explored site. Bioarchaeological analysis of skeletons from several newly excavated graves from Staré Město – ‘Na Valách’

Nové nálezy z již prozkoumané lokality. Bioarcheologická analýza koster z nově objevených hrobů ze Starého Města – „Na Valách”

- Martina Fojtová*, Luděk Galuška, Tomáš Chrástek –

ABSTRACT

In the winter of 2020, a rescue archaeological excavation took place at the construction site of the Cyril and Methodius Centre of the Slovak Museum in the southern part of the well-known Middle Hillfort period burial ground ‘Na Valách’ in Staré Město. The site had already been excavated in the 1940s and 1950s. Nevertheless, several new graves were found. The purpose of this article is to present these new findings to the scientific community.

Graves H 1/2020 to H 4/2020 were discovered in relatively close proximity to each other, while four other graves (H 5/2020 – H 8/2020) were located separately. These graves were all situated on the periphery of the late 1940s and 1950s research areas, where they escaped the attention of archaeologists. Unfortunately, most of the graves were damaged during the machine excavation. This was subsequently reflected in the degree of preservation of the skeletons. In total, nine human skeletons were discovered in seven grave pits. The anthropological analysis identified three adults (one male and two females aged 40–60, 20–30, and 45–55 years) and six non-adults. Three of the immature individuals died between the ages of 15 and 17, one child was about 3 years old, and the two other children were 8–9 years old. Despite the young age (and presumably higher social status) of most of the individuals, many pathologies were found in their skeletons.

The graves are dated from the second half of the 9th century to the beginning of the 10th century. Except for grave H 5/2020, all the other graves yielded rich finds (earrings, a ring, spherical buttons, knives, and ceramic fragments). The nature of the finds indicates that the graves belonged to representatives of the upper social class of early medieval Moravia in the second half of the 9th century.

1. Introduction

The burial site ‘Na Valách’ in Staré Město is the largest church necropolis from the Great Moravian period. Its origins, however, go back much further, dating to the period of the cremation burial rite, as practised by Slavs in our region in the 6th–8th centuries. The oldest skeletal graves date to the turn of the 8th and 9th centuries at the latest; the final remains were buried near the church during the second half of the 10th century. The first significant rescue research was started here in 1928 by Karel Buchtel and Jaroslav Böhm in the garden of Schilder’s Mill. However, it was soon taken over by local archaeologist Antonín Zelnitius, who continued work until 1932 (Niederle, Zelnitius 1929; Zelnitius 1932). Systematic excavations began after World War II in 1948. For nearly 40 years they were directed by Vilém Hrubý, and, after he died in 1985, by Luděk Galuška. In 1949, the foundations of the first proven Great Moravian sacral architecture, a single-nave church with a horseshoe-shaped apse, were discovered at the burial site (Hrubý 1955a, 265–306). When it was realised around the middle of the 9th century, the local burial site became the central necropolis of Christians for the entire settlement agglomeration, containing the graves of the complete social spectrum of the time, from the nobility to the common people. More than 2,000 skeletal graves have been examined here (Hrubý 1955b; Hochmanová-Vávrová 1962; Galuška 2002; 2004; Fojtová, Galuška 2022, etc.), while others, as our study suggests, are still undiscovered under the developed area of the town, even in places we thought were fully excavated. The purpose of this article is to present several such graves that were unexpectedly discovered at the site in 2020.

2. Materials

Rescue archaeological excavation on the building of the Cyril and Methodius Centre of the Slovak Museum (carried out in collaboration by the Moravian Museum and the Slovak Museum in Uherské Hradiště) was conducted in January and February 2020 (Galuška, Langr 2021) at the archaeologically significant early medieval site ‘Na Valách’, near the Monument of Great Moravia in Staré Město (Fig. 1, 2). The excavation started after several skeleton graves were disturbed during the lowering of the ground level by a machine excavator. The site had previously been archaeologically investigated in the 1940s and 1950s by Vilém Hrubý. Thus, no more archaeological finds were expected here. Nevertheless, seven graves and scattered bones were found, apparently overlooked in the earlier research. Unfortunately, most of them were damaged during the machine excavation. This was subsequently reflected in the degree of preservation of the skeletal remains. Grave H 7/2020 was the best preserved, while the remains from grave H 6/2020, which was
almost completely destroyed by the excavator, were in the worst condition. In general, the preservation of the skulls was slightly better than that of the postcranial skeletons. With the possible exception of grave H 6/2020, which may have been a multiple grave, given the unclear stratigraphic relationships, each grave pit contained a single skeleton.

The graves lay in the gravel bedrock of the first river terrace of the River Morava. They were discovered in the southern part of the burial ground sloping southwards towards Jezuitská Street. Six of them (graves H 1/2020 – H 6/2020) were located about 30 to 35 m to the SSE from the apse of the early medieval church ‘Na Valách’. One grave (H 7/2020) was more distant, located 45 m to the south of the church (Fig. 3). Their pits were oriented mostly in the NW–SE or SW–NE direction and – with exceptions – did not show any colour differences in the gravel-sand subsoil. Additionally, it was later discovered that the graves were located at the boundaries of the 1949 and 1950 excavation seasons, between which an unexplored area was left. The latter two facts are probably the reasons why the graves escaped discovery in the past.

3. Methods

Eight individuals were identified from the seven graves containing human skeletal remains (the skeletal remains of one other individual were collected in excavated soil; the grave pit was not preserved). When unearthed, the skeletal remains were stripped of soil residues and carefully cleaned with water and a toothbrush. After drying, the original bone was reconstructed by gluing it where possible with a hot glue gun.

Fig. 1. Location of the site. Map source: Google Earth, Mapy.cz, graphic by M. Fojtová.

Fig. 2. Aerial view of the area of excavation (grave H 1/2020 is missing as it had already been removed at the time the photo was taken.) Photo and graphic by T. Chrástek.
Obr. 2. Letecký pohled na lokalitu (chybí hrob H 1/2020 vyvzvednutý již před pořízením fotografie.) Foto a grafika T. Chrástek.
The degree of preservation of the skeletons was assessed using a system of crosses separately for the skull (S) and the postcranial skeleton (P) (for details, see Fojtová, Galuška 2022, 12). For determining the sex of adult individuals, we preferred methods based on sex differences in pelvic structures (Novotný 1986; Brůžek 2002; Brůžek et al. 2017) and skull (Ferembach et al. 1980). The overall robusticity of the skeleton and the development of muscle tendons were also taken into account. In the case of two juvenile individuals, it was also possible to determine the sex according to the morphology of the pelvis or skull; in the latter case, this determination was also supported archaeologically by grave goods. For other subadult individuals, sex was not determined due to the unreliability of available methods.

The method of assessing the degree of tooth eruption and root maturation (Ubelaker 1978) was preferred for estimating the age at death of children and juveniles (while the root maturation degree was applied only in loose teeth). Where possible, the state of skeletal maturation (Schaefer et al. 2009) was also assessed. Measurement of the length of the long bones (Stloukal, Hanáková 1978) served as an auxiliary criterion. To estimate the biological age in adults, the freeware ADBOU (https://www.statsmachine.net/software/ADBOU2/) (Boldsen et al. 2002), combining assessment of the degree of cranial suture obliteration with age-related changes on the symphyseal surface of the pubic bone and auricular surface of the ilium, was preferably used. The method of assessing the degree of tooth abrasion (Lovejoy 1985) was mainly used as an auxiliary criterion. In one case, the degree of closure of the cranial sutures (Meindl, Lovejoy 1985) was also used. The data acquired by the aforementioned methods (depending on the state of preservation of the skeletons) were summarized and the resulting age was determined as the probable intersection of the obtained age intervals.

For the metric evaluation of adult skeletal remains, the Drozdová (2004) system of dimensions was used. Stature was calculated as per Sjøvold (1990), using the dimension with the highest correlation coefficient available. In cases where it was possible to measure the bones of both sides, the average value was used to calculate stature. The platymeric and pilasteric indices of the femur and cnemic index of the tibia were also calculated, as they are good predictors of the physical load on the respective muscle groups and can therefore provide information about the lifestyle of the individual.

To distinguish individual teeth and their position, a two-digit tooth marking (the so-called dental cross) is most often used in the text. The first digit indicates whether the tooth is permanent (1–4) or deciduous (5–8), and also defines a specific dental quadrant (1 or 5 – upper right, 2 or 6 – upper left, 3 or 7 – lower left, 4 or 8 – lower right quadrant). The order of the teeth in the respective quadrant is then indicated by the second number (1–8 for permanent teeth and 1–5 for temporary teeth) (Leatherman 1971).

The health status of the studied individuals was assessed mainly according to the criteria of Aufderheide and Rodríguez-Martín (1998), Ortner (2003), Horáčková et al. (2004), and Waldron (2009). The basic examination method was the macroscopic evaluation of found pathologies. To refine the paleopathological diagnosis, radiographs (performed at the Department of Clinical Imaging of St. Anne’s University Hospital in Brno) were, in some cases, also made.
4. Results and discussion

4.1. Description of skeletons

**Grave H 1/2020** (Fig. 4, 5)

**Sex:** undetermined  
**Age:** 8–9 years  
**Stature:** undetermined  
**State of preservation:** S+ P+

A child skeleton, laying in the supine position, oriented NW–SE. The skeleton is not very well preserved – the skull has been damaged by an excavator, most vertebrae and skeleton of lower limbs distal to knee joints are missing, and hands and forearms are fragmented. However, the auditory ossicles, probably of the left side, are preserved.

**Anatomical variants:** lambdoid ossicles, bilateral thinning of the occipital plate in the area of the transverse sulcus, and also perforation on the right (probably a vascular connection).

**Pathological changes:** dental enamel hypoplasia (DEH) on the lower permanent incisors. On the exocranial surfaces of the preserved skull bones, subperiosteal new bone formation is accompanied by several areas of increased porosity. Bone formation also occurs on the diaphyses of the long bones of the limbs.

**Grave goods:** three complete grape-shaped silver earrings and a fragment of a fourth one, a spherical button (gombík) made of bronze or copper, and an iron knife.

Fig. 4. Graves H 1/2020 – H7/2020.  
Drawing by L. Galužka, graphic by T. Chrástek.

Kresba L. Galužka, grafika T. Chrástek.
Grave H 2/2020 (Fig. 4, 6)
**Sex:** undetermined (probably a female, based on skull morphology)
**Age:** 15–17 years
**Stature:** undetermined
**State of preservation:** S+ P+

The skeleton may have been lying in the supine position on its back, in NW–SE orientation, but only an incomplete skull and fragments of the upper limbs are preserved. The rest of the skeleton was not found – probably it had been destroyed by the excavator.

**Pathological changes:** linear DEH on the incisors and canines.

**Grave goods:** two pairs of silver earrings decorated with four globes, and a fragment of an animal bone.

Grave H 3/2020 (Fig. 4, 7)
**Sex:** undetermined
**Age:** 15 years
**Stature:** undetermined
**State of preservation:** S+++ P+

The skeleton lying in the supine position in NW–SE orientation, with the skull slightly inclined to the right and verticalized clavicles. The skull is almost completely preserved, the postcranial skeleton is fragmentary, and the bones of the free lower limbs, except for a fragment of the proximal part of the left femur, are completely missing.

**Anatomical variants:** absent parietal foramina.

**Pathological changes:** linear DEH on the front teeth of both jaws, dental calculus on the buccal surfaces of the upper molars. Cribrar orbitalia (porotic type) were noted on both orbital roofs. Porosity on the left-sided articular surfaces of the 1st to 4th cervical vertebrae and the upper surfaces of vertebral bodies C3–5. Periosteal apposition on lateral surfaces of both mandibular rami and the exocranial surfaces of the frontal squama and parietal bones (especially along the coronal suture).

**Grave goods:** one ring-shaped and seven silver grape-shaped earrings in various stages of preservation, and an iron knife.

Grave H 4/2020 (Fig. 4, 8)
**Sex:** female
**Age:** 20–30 years
**Stature:** undetermined
**State of preservation:** S++ P0

Only the damaged gracile skull, placed on the back of the head and slightly bent to the left, and the disarticulated mandible are preserved. Of the postcranial skeleton, only a few small fragments of scapulae, clavicles, atlas, and ribs are present.

**Anatomical variants:** tooth 38 is not developed, and other third molars do not reach the occlusal plane. A perforation (ø 4–5 mm) formed on the mastoid part of the right temporal bone cranially from the mastoid process – probably a vascular connection communicating with the intracranial space.
Pathological changes: linear DEH on the incisors of both jaws. Several extensive carious lesions – the crown of tooth 46 is destroyed, destruction of crown distal surfaces of teeth 14 and 16. A small carious lesion is also present on tooth 14 mesial surface, and at the root tip of this tooth, a periapical lesion drained by a fistula to the vestibular space is formed. About $\frac{1}{3}$ of both the teeth 36 and 37 crowns were destroyed by caries spreading probably from the interdental space. Dental calculus is present on the buccal surfaces of the upper molars. On the endocranial surface, abnormal vascular impressions are developed. Abnormal porosity was noted on the palatal processes of both maxillae.

Grave goods: fragments of three grape-shaped and one six-globe-shaped earring.

Grave H 5/2020 (Fig. 4, 9)
Sex: male
Age: 40–60 years
Stature: 165.6 ± 4.1 cm (F11)
State of preservation: S+ P++
The grave pit of H 5/2020 was damaged by a recent object, some parts of the skeleton were therefore dislocated. Moreover, the grave was disturbed during excavation. The skeleton of medium robusticity with moderately developed muscular attachments was lying in the supine position, probably oriented WSW–ENE. The skull is fragmentary (only fragments of the parietal and occipital bones and the left mandible, and teeth 43 and 44 are preserved). The postcranial skeleton preserves mainly the long bones of the limbs (humerus, femur, tibia, and both fibulae, mostly with damaged epiphyses), as well as a fragment of the right hip bone, proximal part of the right fifth metatarsal, the left tarsals (except the intermediate and lateral cuneiforms), fragments of the right scapula, and the right scaphoid.

Anatomical variants: absent parietal foramina.

Workload indices: hyperplatymeric, no pilaster, eurycnemic.

Pathological changes: the 36 was lost intravitally. The 38 alveolus bears traces of inflammation (the tooth is not preserved). A shallow lesion of 8–10 mm in diameter, with an uneven, porous surface and signs of a reparative process on the edges, was noted on the popliteal surface of the right femur about 15 mm proximal to the medial condyle.

Grave goods: none, except a fragment of a cow’s (Bos primigenius f. taurus) calcaneus and several other animal bone fragments.

Grave H 6/2020 (Fig. 4, 10)
Grave pit H 6/2020 was discovered under dramatic circumstances – the excavator destroyed the grave almost completely, and part of the skeleton was loaded onto the back of a tipper lorry. Subsequently, the operator noticed other parts of the skeleton in the second bucket of the machine and put its contents back in place. As a result, the bones were initially traced in the mound of dirt and then the pit containing additional bones from the bucket was examined until it was possible to recover part of the lower limbs of the skeleton in situ. During anthropological analysis, the skeletal remains of two individuals were found – a female (H 6a/2020) and a child (H 6b/2020). The graves must have been placed very close to each other; we cannot exclude the possibility that it was a double grave.
Grave H 6a/2020
Sex: female
Age: 45–65 years
Stature: undetermined
State of preservation: S+++ P++
A skeleton of medium robusticity with strong muscular relief resting in a supine position on its back, probably in SSW–NNE orientation. The skull is completely preserved. The postcranial skeleton preserved mainly long bones of the limbs (humerus, femur, tibia, and fibula of both sides, though with damaged epiphyses), the skeleton of both legs, left hip bone, fragments of forearm bones, and scapulae.
Anatomical variants: lambdoid ossicles, left asterionic ossicle, zygomaticofacial foramen bilaterally doubled.
Workload indices: platymeric, middle pilaster, mesocnemic.
Pathological changes: intravital loss of teeth 16 and 36, almost half of tooth 37 crown destroyed by caries. Other carious lesions on tooth 26 distal surface. Periodontitis, dental calculus. Osteoarthritis in the interphalangeal joints of the left foot.
Grave goods: one silver grape-shaped earring and fragments of unidentified animal bones.

Grave H 6b/2020
Sex: undetermined
Age: 3 years
Stature: undetermined
State of preservation: S+ P+
Fragments of a child skeleton collected from the bucket of an excavator together with grave H 6a/2020. Only several fragments of the cranial vault, a pyramid of the right temporal bone, the crown of one tooth (26), fragments of femoral diaphyses, left (?) tibia, right clavicle, and a fragment of a rib have been preserved.

Grave H 7/2020 (Fig. 4, 11)
Sex: female
Age: 15–16 years
Stature: 159.5 ± 4.49 cm (F1)
State of preservation: S+++ P++++
An exceptionally well-preserved skeleton placed in the supine position with extended extremities, skull on base, mandible in anatomical position, oriented from SW to NE. Gracile skeleton with low muscular attachments, complete skull, only parts of frontal and right parietal bones were damaged during excavation. Dentition is complete, third molars except 28 are not erupted. The postcranial skeleton is also more or less complete, with only some small bones of legs and arms and some epiphyses of long bones of limbs missing.
Anatomical variants: lambdoid ossicles, left parietal notch ossicle, left supratrochlear foramen. Only 11 pairs of ribs (the 12th pair is rudimentary, on the right side only in the form of about 5 mm tubercle of the body of Th12).
Workload indices: hyperplatymeric, no pilaster, eurycnemic. Significant entheseal changes are visible on the attachment points of the levator veli palatini muscle (on caudal surfaces of the temporal pyramid ventromedially from the carotid canal).
Pathological changes: dental calculus, periodontitis, linear DEH on tooth 22, cribra femoralia of pelvic bones of both sides and the proximal part of the right femur were preserved.
State of preservation: S+ P+
State of preservation: S0 P+
Anatomical variants: lambdoid ossicles, left parietal notch ossicle, left supratrochlear foramen. Only 11 pairs of ribs (the 12th pair is rudimentary, on the right side only in the form of about 5 mm tubercle of the body of Th12)
Workload indices: hyperplatymeric, no pilaster, eurycnemic. Significant entheseal changes are visible on the attachment points of the levator veli palatini muscle (on caudal surfaces of the temporal pyramid ventromedially from the carotid canal).
Pathological changes: dental calculus, periodontitis, linear DEH on front teeth. Porosity is visible on the endocranial surfaces of the cranial bones (especially on the left) and the inner surface of the mandibular rami cranially from the mandibular foramina. The third cervical vertebra was probably destroyed by a pathological process, the spinous process of the second cervical vertebra points up, and the corresponding process of the fourth cervical vertebra is compressed somewhat downward. On the affected surfaces of both spinal processes, there are signs of an ongoing pathological process that ‘pushed’ them. Furthermore, a calcified object was found in the region of the upper cervical spine – probably a fragment of calcified soft tissue. Inflammatory changes are visible in the radial and coronoid fossae of the right humerus.
Grave goods: A bronze ring, five ceramic fragments, fragments of bird bones, probably a domestic chicken (Gallus gallus f. domestica), and a vertebral fragment of a pig (Sus scrofa f. domestica).

Grave H 8/2020
Sex: undetermined
Age: 8–9 years
Stature: undetermined
State of preservation: S0 P+
In the area between graves H 6/2020 and H 7/2020, a few bones, apparently originally belonging to a single individual, were dug up by the excavator. They were labelled as grave H 8/2020, although it is not entirely certain that this was a separate grave. Only the left maxilla with several teeth (deciduous 63–65 and permanent 22, 26, and 27), fragments of vertebrae and ribs, bones of the right forearm with several metacarpals, fragments of pelvic bones of both sides and the proximal part of the right femur were preserved.
Pathological changes: linear DEH on tooth 22, cribra femoralia on the right femoral neck.

4.2. Basic anthropological analysis
A summary of the basic anthropological data on the skeletal remains found is given in Tab. 1, Graph 1 gives an idea of the age structure of the studied group of individuals. Most of the skeletal remains belonged to subadults (six of the nine skeletons recovered). These included three juveniles aged 15–17 (grave H 2/2020), 15 (H 3/2020) and 15–16 (H 7/2020), two of whom are presumed to be female (almost certainly so for grave H 7/2020, based on pelvic morphology, and probably so for grave H 2/2020, based on skull morphology and grave goods), two children aged 8–9 (graves H 1/2020 and H 8/2020), and one three-year-old child deposited in grave 6b/2020. Children’s graves are more likely to escape attention due to their generally smaller size and depth, so their prevalence amongst the ‘forgotten’ graves is not surprising. Only three graves belonged to adults – a young woman aged 20–30 (grave H 4/2020) and a middle-aged man and woman (graves H 5/2020 aged 40–60 and H 6a/2020 aged 45–65 respectively). In the case of grave H 6/2020, therefore, there is a possibility it was a double grave.
The preservation of individual skeletons varied greatly. As expected, the remains of the child from grave H 8/2020 were in the worst condition, having been picked up by an excavator during overburden stripping. Therefore, the exact location and parameters of this grave are unknown. In contrast, the best-preserved skeleton was that of a young girl from grave H 7/2020. The occurrence of epigenetic traits (anatomical variants) cannot be more comprehensively assessed in such a limited population. It can only be stated that lambdoid ossicles and absent parietal foramina occurred repeatedly in the studied individuals, as well as abnormal vascular connections. However, these conditions are common in Great Moravian populations (see e.g. Velemínský et al. 2008; Fojtová 2012).

As far as metric evaluation is concerned, relevant results could be obtained only for the skeletons from graves H 5/2020, H 6/2020, and H 7/2020. For graves H 5/2020 and H 7/2020, it was possible to calculate the probable stature. In the case of male from grave H 5/2020, it was 165.6 ± 4.1 cm, slightly below the average in the context of the Great Moravian population (see No. of individuals

<table>
<thead>
<tr>
<th>Sex</th>
<th>Age (years)</th>
<th>Stature (cm)</th>
<th>State of preservation</th>
<th>Anatomical variants</th>
<th>Workload indices</th>
<th>Pathological changes</th>
<th>Grave goods</th>
</tr>
</thead>
<tbody>
<tr>
<td>H 1</td>
<td>?</td>
<td>8–9</td>
<td>S+ P+</td>
<td>Lambdoid ossicles, bilateral thinning of the occipital plate in the area of the transverse sulcus with perforation on the right (vascular connection?)</td>
<td>Linear DEH, possible scurvy</td>
<td>3 complete grape-shaped silver earrings, a fragment of the fourth one, a decorative button (gombík), 1 iron knife</td>
<td></td>
</tr>
<tr>
<td>H 2</td>
<td>Female</td>
<td>15–17</td>
<td>S+ P+</td>
<td>Linear DEH</td>
<td>2 pairs of silver globe-shaped earrings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H 3</td>
<td>?</td>
<td>15</td>
<td>S+++ P+</td>
<td>Absent parietal foramina</td>
<td>Linear DEH, dental calculus, cribra orbitalia, periosteal new bone formation on the frontal and parietal bones and mandible, abnormal porosity of cervical vertebrae</td>
<td>7 gold-plated silver grape-shaped earrings, 1 ring-shaped earring, 1 iron knife</td>
<td></td>
</tr>
<tr>
<td>H 4</td>
<td>Female</td>
<td>20–30</td>
<td>S++ P0</td>
<td>Agenesis of 38, abnormal vascular connection on the mastoid part of the right temporal bone</td>
<td>Linear DEH, dental calculus, 6 dental caries, abnormal vascular impressions on the endocranial surface, porosity on the palatal processes of both maxillae</td>
<td>Fragments of 3 grape-shaped and 1 globe-shaped earring</td>
<td></td>
</tr>
<tr>
<td>H 5</td>
<td>Male</td>
<td>40–60</td>
<td>165.6</td>
<td>Absent parietal foramina</td>
<td>Hyperplatymeric</td>
<td>1 intravital tooth loss, inflammation changes in the 38 alveolus, a lesion on the popliteal surface of the right femur</td>
<td></td>
</tr>
<tr>
<td>H 6a</td>
<td>Female</td>
<td>45–65</td>
<td>S+++ P+</td>
<td>Lambdoid ossicles, left asterionic ossicle, exostotic facial foramen bilaterally doubled</td>
<td>Platymeric</td>
<td>2 intravital tooth losses, 2 dental caries, periodontitis, dental calculus, osteoarthritic changes in the interphalangeal joints of the left foot</td>
<td>1 silver grape-shaped earring</td>
</tr>
<tr>
<td>H 6b</td>
<td>?</td>
<td>3</td>
<td>S+ P+</td>
<td>Linear DEH, dental calculus, periodontitis, porosity on the endocranial surfaces and on the inner surface of the mandibular ramus above the mandibular foramina. C3 destroyed, spinous processes of C2 and C4 deformed, a calcified object found in the region of the upper cervical spine, inflammatory changes in the radial and coronoid fossae of the right humerus</td>
<td>1 bronze ring, 5 ceramic fragments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H 7</td>
<td>Female</td>
<td>15–16</td>
<td>159.5</td>
<td>Lambdoid ossicles, left parietal notch ossicle, left supratrochlear foramen, 11 pairs of ribs, entheseal changes on the attachment points of the levator veli palatini muscle</td>
<td>Hyperplatymeric</td>
<td>Linear DEH, dental calculus, periodontitis, porosity on the endocranial surfaces and on the inner surface of the mandibular ramus above the mandibular foramina. C3 destroyed, spinous processes of C2 and C4 deformed, a calcified object found in the region of the upper cervical spine, inflammatory changes in the radial and coronoid fossae of the right humerus</td>
<td></td>
</tr>
<tr>
<td>H 8</td>
<td>?</td>
<td>8–9</td>
<td>S0 P+</td>
<td>Linear DEH, cribra femoralia</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tab. 1. Basic data on skeletal remains included in the analysis.

Graph 1. Representation of age categories of the skeletal series.

The preservation of individual skeletons varied greatly. As expected, the remains of the child from grave H 8/2020 were in the worst condition, having been picked up by an excavator during overburden stripping. Therefore, the exact location and parameters of this grave are unknown. In contrast, the best-preserved skeleton was that of a young girl from grave H 7/2020.

The occurrence of epigenetic traits (anatomical variants) cannot be more comprehensively assessed in such a limited population. It can only be stated that lambdoid ossicles and absent parietal foramina occurred repeatedly in the studied individuals, as well as abnormal vascular connections. However, these conditions are common in Great Moravian populations (see e.g. Velemínský et al. 2008; Fojtová 2012).

As far as metric evaluation is concerned, relevant results could be obtained only for the skeletons from graves H 5/2020, H 6/2020, and H 7/2020. For graves H 5/2020 and H 7/2020, it was possible to calculate the probable stature. In the case of male from grave H 5/2020, it was 165.6 ± 4.1 cm, slightly below the average in the context of the Great Moravian population (see
e.g. Stloukal 1999, 384; it must be taken into account that the results obtained by different authors and methods may differ, so these data should be taken with some reserve). The girl from grave H 7/2020 measured approximately 159.5 ± 4.49 cm, which is equivalent to the average statures of Great Moravian women, but the growth of this girl was not yet complete at the time of her death, so theoretically her adult stature could have been slightly higher. Cranial measurements and indices could only be determined for two individuals (graves H 6/2020 and H 7/2020), and their summary is given in Tab. 2.

### 4.3. Health status and traces of workload

Dental and periodontal diseases were the most frequent pathologies in the studied group of skeletons. The most common of them was linear dental enamel hypoplasia (DEH), which was present in six individuals. DEH is considered a marker of non-specific stress during childhood such as weaning, starvation, infections, etc. (Schultz et al. 1998, 299), and is very common in early medieval populations (see also Trefný, Velemínský 2008; Jarošová 2012; Přichystalová et al. 2019, 240). Dental caries and associated intravital tooth loss were observed in all three adults, who had eight carious lesions and three proven intravital tooth losses in total, with the teeth of the young female from grave H 4/2020 being the most affected (Fig. 12). In addition, in two of caries, the infection spread from the pulp cavity through the root canal and formed periapical lesions around the root tip, one of which was drained by a fistula. Two adults and two juveniles suffered from dental calculus (mineralized bacterial plaque). The inflammatory process caused by the bacterial stimulation of plaque leads first to gingivitis and later to loss of bone and periodontitis (Strohm, Alt 1998, 234), which was observed in two cases.

Surprisingly, the latter disease was, except for the elderly female from grave H 6a/2020, also present in the 15–16-year-old girl from grave H 7/2020, who was moreover seriously ill – her third cervical vertebra was probably destroyed by some type of osteolytic neoplasm (Fig. 13, 14, 15) and the subsequent damage to the spinal cord may have been the likely cause of the girl’s death, as spinal cord trauma above C4 level usually leads to total paralysis, including respiratory muscles.

The occurrence of porous and hyperostotic skeletal lesions, such as orbital or femoral cribra (Fig. 16, 17), is probably associated with nutritional stress (especially anaemia) (Horáčková et al. 2004, 146). They are found predominantly in children and juveniles, which also corresponds to the cases described here (subadults at the age of 8–9 and 15 years, respectively). Subperiostal new bone formation with porous lesions on the skull and limb bones in the child’s skeleton from grave H 1/2020 (Fig. 18) may indicate that the individual suffered from scurvy (see Ortner, Ericksen 1997;
The porotic lesions on the skeleton of the juvenile individual from grave H 3/2020 could be of similar aetiology. Abnormal vascular impressions on the endocranial surface, found in the skull of young female from grave H 4/2020, are probably impressions of abnormal branching of the arteria meningea media, which is most often a manifestation of an ongoing inflammatory process or subdural haemorrhage, usually caused by trauma or systemic disease; a combination of both factors is also possible (Ortner 2003, 93; Lewis 2004). There was also one case of osteoarthritis (age-related degenerative joint changes). A shallow lesion of unclear aetiology on the right femur of a male from grave H 5/2020 (Fig. 19) adds to the range of pathologies. In only three individuals the skeleton of the lower limbs was sufficiently preserved to calculate workload indices, which are important markers of physical load. The decreasing value of the cnemic index of the tibia is considered to be a sign of increased load on the muscle groups active in the squatting position (Velemínský, Dobisíková 2000). The decreasing value of the platymeric index of the femur indicates the degree of anteroposterior plating of the upper third of the diaphysis caused by increased activity of the gluteus maximus and the hip adductors.

Fig. 14. Grave H 7/2020 – partially destroyed 3rd cervical vertebra (upper) and 4th cervical vertebra (lower) with spinal process pushed downwards. Photo by M. Fojtová.


Fig. 15. Grave H 7/2020 – a calcified object found in the region of the upper cervical spine. Photo by M. Fojtová.


Fig. 16. Grave H 3/2020 – cribra orbitalia (porotic type) on the right orbital roof. Photo by M. Fojtová.


Fig. 17. Grave H 8/2020 – cribra femoralia on the right femoral neck. Photo by M. Fojtová.


Fig. 18. Grave H 1/2020 – subperiosteal new bone formation and porosity on the right parietal and temporal bone. Photo by M. Fojtová.


Waldron 2009, 132). The porotic lesions on the skeleton of the juvenile individual from grave H 3/2020 could be of similar aetiology.

Abnormal vascular impressions on the endocranial surface, found in the skull of young female from grave H 4/2020, are probably impressions of abnormal branching of the arteria meningea media, which is most often a manifestation of an ongoing inflammatory process or subdural haemorrhage, usually caused by trauma or systemic disease; a combination of both factors is also possible (Ortner 2003, 93; Lewis 2004). There was also one case of osteoarthritis (age-related degenerative joint changes). A shallow lesion of unclear aetiology on the right femur of a male from grave H 5/2020 (Fig. 19) adds to the range of pathologies.

In only three individuals the skeleton of the lower limbs was sufficiently preserved to calculate workload indices, which are important markers of physical load. The decreasing value of the cnemic index of the tibia is considered to be a sign of increased load on the muscle groups active in the squatting position (Velemínský, Dobisíková 2000). The decreasing value of the platymeric index of the femur indicates the degree of anteroposterior plating of the upper third of the diaphysis caused by increased activity of the gluteus maximus and the hip adductors.
(Stránská 2014, 337). Finally, the increasing value of the plas-teric index of the femur indicates an increased load on the muscles connecting to the middle part of the linea aspera femoris, the function of which is knee joint flexion. While the cnemic index of the tibia in all three measurable individuals takes on values of meso- or eurycnemia and pilaster index values were low or medium and are therefore not indicative of a more intense load on the relevant muscle groups, the values of the platymetric index in all three measurable individuals indicate a high load on the rele-vant muscle groups, which is usually related to frequent walking (or running) in difficult terrain or over longer distances (Capasso et al. 1999). Similar results are known from other contem-porary populations (Tvrdý 2012, 41; Stránská 2014, 338; Fojtová, Galuška 2022, 32, etc.)

5. Grave goods

Of the seven grave pits uncovered, six contained grave goods in varying degrees of preservation, and one was without finds (grave H 5/2020). In one case (grave H 8/2020) the (non)presence of grave finds cannot be assessed due to the circumstances of its discovery. Notable among the graves were those in which children or younger individuals and one young woman were buried. Except for the girl from grave H 7/2020, equipped with ‘only’ a bronze ring decorated with beating, all the other burials were placed in the graves with silver jewellery (earrings). Of these, the 15-year-old individual from grave H 3/2020 stands out with eight silver earrings, seven of which were grape- and one ring-shaped. Earrings with a bilateral (less often only the lower one) grape made of rings of granules, found in graves H 1/2020, H 4/2020, and H 6/2020, belong to the most typical and widespread Great Moravian jewellery (Fig. 20). It is worth noting that some of these earrings have one end of the lower arch split and twisted into an eyelet, which is sometimes considered a chronologically younger element. In grave H 2/2020, a young woman or girl was provided with two pairs of earrings decorated with four globes on the lower arch, the surface of which is decorated with ornaments set with granules. Again, this is one of the more common types of Great Moravian earrings found in most of the settlements associated with the life (and death) of the social elite of the time. One fragment found also appears to belong to a 6-globe earring, which only began to appear in the late 9th century. Both the grape- and globe-shaped earrings belong to the group of so-called luxurious Veligrad jewellery (e.g. Galuška 2013, 223–251, Ungerman 2021).

Among other decorations coming from the examined graves, it is worth noting the aforementioned ring and a bronze spherical button with a surface covered with rings of twisted wire, which, although not belonging to the Veligrad jewellery group, may occur together with them in one grave (see grave H 1/2020). Two iron knives in the remains of sheaths and five pottery frag-ments complete the grave finds. These were discovered in grave H 7/2020 and are likely to have been placed on the young wom-an’s chest during the burial ceremony.

The rich equipment of children and young individuals in graves from the Great Moravian period is a known fact. The jewellery and ornaments, as well as miniature weapons and spurs in the graves, suggest that these children were already a full-fledged part of society at an early stage of their lives and that these finds are attributes of their membership in important Moravian families of the 9th century (e.g. Profantová 2005; Galuška 2022, 72–74, 149–150; Kouřil 2022, 263–266).

6. Conclusions

With more than 2,000 uncovered graves, the burial site in Staré Město – ‘Na Valách’ is one of the most extensive necropolises in Great Moravia. More graves continue to be discovered, even in places that for many years were thought to have been completely explored. This is demonstrated by the latest additions from 2020. As no further archaeological discoveries were expected at the site

Fig. 19. Grave H 5/2020 – a lesion of unclear aetiology on the right popliteal surface of the femur. Photo by M. Fojtová.


Fig. 20. Grape-shaped earrings from graves H 1/2020 (1, 2, 10), H 3/2020 (3–9), and H 4/2020 (11, 12). Photo and graphic by T. Chrástek.

of the rescue excavation, most of the graves were significantly damaged when the topsoil was removed. The graves may have escaped the attention of archaeologists in the 1940s and 1950s because of their location on the edges of the research areas. As might be expected, the majority of the graves belong to children and juveniles. These tend to be smaller and shallower, with gracile skeletons that are preserved in a worse condition.

Although almost all the graves contained rich grave goods, the nature of which indicates that they belonged to representatives of the upper social class of early medieval Moravia, the anthropological analysis showed both many mainly dental pathologies and traces of workload related to intensive walking.

From the chronological point of view, based on the findings, the graves can be dated to the younger phase of the burial ground ‘Na Valách’, i.e. from the second half of the 9th century to the beginning of the 10th century. Following the planned revision and evaluation of anthropological data, particularly from earlier excavations at this site and their overall synthesis within a broader context, the findings from 2020 will contribute another valuable stone to the mosaic of the overall picture of the life of the inhabitants of one of the main centres of the Great Moravian Empire.

Acknowledgements

The article appears through the institutional support of long-term conceptual development of research institutions provided by the Ministry of Culture (ref. MK00009482).

The authors would like to thank Jakub Langr (Center for Slavonic Archaeology, Moravian Museum, Brno) for cooperation on field research in difficult winter conditions, Martina Roblíčková (Anthropos Institute, Moravian Museum, Brno) for the taxonomic classification of the osteoarchaeological material, Jan Holub (Department of Clinical Imaging, St. Anne’s University Hospital, Brno) for making radiographs, and Lenka Vargová and Kateřina Vymazalová (Department of Anatomy, Faculty of Medicine, Masaryk University, Brno) for consulting on some paleopathological cases.

References


Resumé


New finds at a previously explored site. Bioarchaeological analysis of skeletons from several newly excavated graves from Staré Město – „Na Valách“

Fojtová, M., Galuška, L., Chrastek, T. • Přehled výzkumů 65/1, 2024 • ACCEPTED MANUSCRIPT / IN PRESS


Přichystalová, R., Kalová, K., Boberová, K. 2019: Přehled výzkumů 65/1, 2024 X ACCEPTED MANUSCRIPT / IN PRESS


Z chronologického hlediska lze na základě nálezů hroby datovat do malého fáze pohřebiště „Na Valách“, tj. od 2. poloviny 9. století do počátka 10. století. Po plánované revizi a vyhodnocení antropologických dat zejména z dřívějších výzkumů na této lokalitě a jejich zařazení do širšího kontextu se nálezy z roku 2020 jistě stanou dalším cenným kamínkem v mozaice celkového obrazu života obyvatel jednoho z hlavních center Velkomoravské říše.

**Contacts**

Martina Fotová  
Moravian Museum  
Anthropos Institute  
Zelný trh 6  
CZ-659 37 Brno  
mfotova@mzm.cz  
ORCID: 0000-0002-3444-4107

Luděk Galuška  
Moravian Museum  
Centre for Slavonic Archaeology  
Velehradská třída 537  
CZ-686 01 Uherské Hradiště  
lgaluska@mzm.cz  
ORCID: 0000-0002-1374-651X

Tomáš Chrásteck  
Slovak Museum  
Smetanovy sady 179  
CZ-686 01 Uherské Hradiště  
tomas.chrasteck@slovakmuseum.eu  
ORCID: 0009-0008-5668-9210