

# Late Antique burials in an Iron Age Tumulus from Privlaka

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*Examples of secondary subsequent burials in tumuli can be found throughout Europe. Archaeological excavations of the Iron Age tumulus in Privlaka yielded a total of 14 burials. Only one of the graves can be dated to the time of the construction of the tumulus, while the remaining 13 are dated to the Late Antique period. All but one of the graves contained the remains of subadults. There are many advantages to the analysis of non-adult skeletal remains. The study of growth rather than adult stature means that the age at which a certain group of children or a particular subadult have a stressful period can be examined.*

**Key words:** Iron Age tumulus, secondary subsequent burials, Late Antiquity.

## Introduction

Systematic excavations of the Iron Age Škonica tumulus in Privlaka near Nin were conducted in 2006 and 2008 by the Department of Archaeology of the University of Zadar under the supervision of prof. dr. sc. Brunislav Marjanović. The tumulus measured 30 meters in diameter and was approximately 3.5 meters high in the mid section. The excavation revealed a total of 14 burials. Only one grave (grave No. 14) can be related to Iron Age, the time of the construction of the tumulus, while the remaining 13 burials belong to the Late Antique period. The graves were rather shallow and characterised by simple grave construction. All of the graves were E-W orientated with minor deviations, and all of the deceased were laid on their back with the head positioned in the west part of the grave (Marjanović 2007). Grave offerings and finds are very rare and on the basis of datable finds can be placed to the 6<sup>th</sup> century AD (Vinski 1991; Fabijanić 2008). All but one of the graves yielded skeletal remains of subadults.

There are many advantages to the study of non-adult skeletal remains. For many years the study of infant and subadult skeletons has been unjustly under-represented in anthropological analyses. There are several reasons for that – different funerary practices combined with the fact that subadult bones are very fragile and in most cases buried in shallow graves results in their destruction or very poor preservation.

Age at time of death in subadults can be assessed with greater precision than in adult skeletons. Age estimates in children rely on specific markers such as the chronology of epiphyseal and diaphyseal union and deciduous and permanent dentition. Therefore, the age at death in subadult skeletons can be assessed more accurately than in adults. The study of growth rather than adult stature means that the age at which a certain group of children or a particular subadult have a stressful period (in a biological sense) can be examined.

Since the early 1980s a combination of several osteological indicators has been used to provide evidence of malnutrition in past populations. It is unlikely that a malnourished child is deficient in one single dietary element, so one should expect a combination of lesions associated with the lack of iron, zinc, calcium, protein and vitamins (Lewis 2006).

## **Materials and methods**

Human osteological material analysed in this paper originates from the archaeological site Škornica in Privlaka. The excavation revealed an Iron Age tumulus with a total of 14 burials. Only one burial was dated to the original time of the construction of the tumulus, while the 13 remaining burials can be dated to Late Antiquity (6<sup>th</sup> century AD). Only skeletons from the subsequent secondary burials dated to Late Antique period are analysed in this paper. For the purpose of this paper the term secondary burial is adopted after Burns (1991) who claims that a secondary burial is any subsequent burial, and that while the remains may have been disinterred many times each new burial is called a secondary burial.

The skeletal remains were in a poor state of preservation, but nevertheless basic anthropological analysis could have been conducted.

Anthropological analyses included determining the sex and age at death of the adult individual, subadult mortality, and pathological changes indicative of subadult stress.

In determining the sex of the skeletons basic anthropological criteria based on the morphological differences between males and females in both cranial (Krogman & Iscan 1986), and postcranial skeleton (Kimura 1982; Phenice 1969; Sutherland & Suchey 1991; Weaver 1980) were used. No attempt was made in determining the sex of subadults less than 15 years of age at the time of death.

The age at death of subadults was assessed based on the chronology of epiphyseal and diaphyseal union, deciduous and permanent dentition formation, and length of long bones diaphyses. (Bass 1995; Fazekas & Kósa 1978; Scheuer & Black 2000).

The age at death of the adult skeleton was assessed using several skeletal elements: changes to the pubic symphysis (Brooks & Suchey 1990) and the auricular surfaces of the pelvis (Lovejoy *et al.* 1985), obliteration of the cranial and maxillary sutures (Meindl & Lovejoy 1985), degenerative osteoarthritis in the joints (Mann & Jantz 1988; Meindl & Lovejoy 1985; Pfeiffer 1991), and obliteration of the occlusal surfaces on the teeth.

The age of the adult was given within a five-year range (e.g. 20–25), while the age of subadults was determined within a range of one year.

Indicators of subadult stress and pathologies included in the analysis are: *cribra orbitalia*, non-specific infectious diseases (*periostitis*), linear enamel hypoplasia, ectocranial porosity, Schmorl's nodes, and degenerative osteoarthritis.

*Cribra orbitalia* refers to the porous, sieve-like lesions of the orbital roof. *Cribra orbitalia* is thought to be indicative of iron deficiency anaemia, which is most likely the result of malnutrition, chronic blood loss or parasitic infestation. The highest frequencies of *cribra orbitalia* in most cases occur before 5 years of age (Mansforth *et al.* 1978; Goodman & Armelagos 1988)

The most common cause of non-specific diseases are infections, and the most common form found in archaeological populations (i.e. the human skeleton) are non-specific periosteal reactions called *periostitis* which is the inflammation of the peripheral bone. Inflammation of the periosteum is usually caused by trauma or parasitic infections. (Ortner 2003; Larsen 1997).

Linear enamel hypoplasia is manifested as horizontal defects of dental enamel on the buccal surfaces of the teeth (Goodman & Rose 1990). This is a subadult disorder which has for a long time been used as a non-specific indicator of physiological stress (Guatelli-Steinberg & Luckas 1999). Because of the nature of the dental enamel the defects cannot be remodelled and therefore represent the most permanent indicator of subadult physiological stressful incidents during the first 7 years of life (during which time permanent dentition is completely formed) (Lewis & Roberts 1997).

Ectocranial porosity is defined as small sieve-like pits that appear on the outer surface of the cranial vault, particularly around bregma, the sagittal suture and the squama of the occipital bone. This type of cranial porosity has been reported in American soldiers who died as prisoners of war during the Korean conflict (McKern & Stewart 1957). This condition is usually attributed to extreme and prolonged nutritional deprivation.

Schmorl's nodes are lesions which result from herniation and displacement of intervertebral disc. The presence of such lesions is usually idiopathic. The most common causes are degenerative changes associated with ordinary stress on the vertebral column (Schmorl & Junghanns 1971).

Degenerative osteoarthritis is characterised by the progressive formation of osteophytes around the edges of an articular joint surface. These changes are associated with the wear and tear of everyday activities and are distinguished from traumatic arthritis which is caused by disruption of the biomechanical functioning of a joint.

## Results

### Grave 1

**Sex:** subadult.

**Age at death:** 6.5 – 7.5 years.

**Pathological features:** not present.

**Associated material or animal bones:** not present.

### Grave 2, individual A

**Sex:** subadult.

**Age at death:** 5 – 6 years.

**Pathological features:** not present.

**Associated material or animal bones:** animal bones.

### Grave 2, individual B

**Sex:** subadult.

**Age at death:** 10.5 – 11.5 years.

**Pathological features:** mild active periostitis is present on the right tibia. Linear enamel hypoplasia is present on the teeth.

**Associated material or animal bones:** not present.

### Grave 3

**Sex:** subadult.

**Age at death:** 1 – 4 years.

**Pathological features:** not present.

**Associated material or animal bones:** animal bones.

### Grave 4

**Sex:** subadult.

**Age at death:** 5 – 7 years.

**Pathological features:** not present.

**Associated material or animal bones:** not present.

Grave 5

**Sex:** subadult.

**Age at death:** 14.5 – 15.5 years.

**Pathological features:** mild healed ectocranial porosity is present on both parietals and the occipital bone. Mild hyperostosis *frontalis interna* is present. Hyperostosis *frontalis interna* is defined as irregular thickening of the inner surface of the frontal bone.

**Associated material or animal bones:** not present.

Grave 6

**Sex:** subadult.

**Age at death:** 6 – 8 years.

**Pathological features:** not present.

**Associated material or animal bones:** not present.

Grave 7

**Sex:** subadult.

**Age at death:** 3 – 4 years.

**Pathological features:** mild healed cribra orbitalia is present in the orbits.

**Associated material or animal bones:** not present.

Grave 8

**Sex:** subadult.

**Age at death:** 1.5 – 2.5 years.

**Pathological features:** even though, not a pathological condition, it is of interest to note that gemination of the maxillary 1<sup>st</sup> incisor is present. Tooth gemination is a dental phenomenon that happens when two tooth crowns develop from one root.

**Associated material or animal bones:** fragment of a metal object.

Grave 9

**Sex:** subadult.

**Age at death:** 1 – 2 years.

**Pathological features:** not present.

**Associated material or animal bones:** sea shell.

Grave 10

**Sex:** subadult.

**Age at death:** 1 – 2 years.

**Pathological features:** mild healed cribra orbitalia is present in the orbits.

**Associated material or animal bones:** animal bone.

**Surplus bones:** ribs, left clavicle and left humerus of a subadult 1 – 3 years of age.

Grave 11

**Sex:** subadult.

**Age at death:** 4 – 5 years.

**Pathological features:** mild healed cribra orbitalia is present in the orbits.

**Associated material or animal bones:** not present.

Grave 12

**Sex:** male.

**Age at death:** 35 – 40 years.

**Pathological features:** mild healed periostitis is present on both femora. Scmorl's node is present on the 12<sup>th</sup> thoracic vertebrae. Linear enamel hypoplasia is present on the teeth.

**Associated material or animal bones:** not present.

Grave 13

**Sex:** subadult.

**Age at death:** 5 – 6 years.

**Pathological features:** not present.

**Associated material or animal bones:** pottery fragment.

### **Discussion and concluding remarks**

Secondary burials into tumuli are not a phenomenon limited to Dalmatia and examples of such secondary burials can be found throughout Europe. Subsequent secondary burials placed in the already existing tumuli have started to appear as early prehistory. The number of tumuli with subsequent burials dated to Late Antique period is relatively small. In the region between the Zrmanja and the Neretva river the occurrence of secondary subsequent burials is most prominent in the Late Middle Ages (47%), followed by the Early Middle Ages (28%), and the burials dated to Late Antique period (6%) (Šućur 2017).

Despite the poor state of preservation of the skeletal material some pathological features were observed in the sample. These include cribra orbitalia, periostitis, linear enamel hypoplasia, ectocranial porosity, Schmorl's nodes, and degenerative osteoarthritis.

Cribra orbitalia is generally accepted as an osteological indicator of subadult anaemia caused by iron deficiency, which is in itself the result of poor nutrition, endemic parasitism, unsanitary living conditions, or chronic gastrointestinal disease (Larsen 1997; Mittler & Van Gerven 1994). Data collected from different osteological series from different archaeological sites showed that the 'active' form of this pathology is most commonly seen in children, while if present in adults it is almost always in the 'healed' form (Walker 1986; Larsen *et al.* 1992; Mittler & Van Gerven 1994). This leads to the logic conclusion that cribra orbitalia is the result of subadult anaemia, while in adults it is only a sign of a stressful period from which the individual had obviously recuperated (Mittler & Van Gerven 1994). A considerable number of previous bioarchaeological investigations have included anaemia as a manifestation of the metabolic bone disease (e.g. Roberts & Manchester 2005). This inclusion is largely derived from the role of dietary iron-deficiency in combination with anaemia. The extensive involvement of bone marrow in order to regenerate blood cell supply results in secondary effects on bone cells and structure. The specific diagnosis of iron deficiency anaemia in past populations is complex and likely over-estimated, particularly as the wide range of potential causative factors, which includes intestinal parasitic infections and/or excessive blood loss, are frequently overlooked (Brickley & Ives 2010). Combined with other variables, linear enamel hypoplasia is a good indicator of subadult stress.

The occurrence of the above mentioned pathologies is similar to the previously published studies of bioarchaeological characteristics of the Late Antique populations from Croatia (Šlaus 1999; 2001; Šlaus & Novak 2014; Novak *et al.* 2009; Vyroubal *et al.* 2013).

Apart from these pathological features, two paleopathological oddities were also observed in the sample: tooth gemination and hyperostosis frontalis interna. Hyperostosis frontalis interna refers to an irregular thickening of the inner surface of the frontal bone. The estimated incidence of hyperostosis frontalis interna in the general population is between 5% to 12%, and has shown to be sex- and age-dependant phenomenon, with females manifesting a significantly higher prevalence than males (May *et al.* 2011). The occurrence of this condition is extremely rare in subadults.

The other rather rare condition observed in this small sample is tooth gemination. The cause of gemination is still unknown, although environmental factors such as trauma, vitamin deficiencies, systemic diseases, and certain genetic predisposition have been suggested as possible causes (Neena *et al.* 2015).

The Škornica tumulus is unique compared to other tumuli in this region due to its monumentality, peculiarities of the construction and the secondary Late Antique/Early Christian burials (Marjanović 2013.). From an anthropological point of view the importance of this site is in the demography of the individuals buried in the secondary graves. All but one individual are subadults, their ages ranging from 1 to 15 years at death. Even though the skeletal remains were in a relatively poor state of preservation and bones exhibit no clear evidence of malnutrition or trauma, certain pathologies were recorded.

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