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The Harsh Life on the 15th Century Croatia-Ottoman Empire Military Border: Analyzing and Identifying the Reasons for the Massacre in Čepin

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ABSTRACT Excavation of the historic period cemetery in Čepin, Croatia revealed the presence of a large number of perimortem injuries distributed among males, females, and subadults. Archaeological and historical data suggest these individuals were victims of a raid carried out by Turkish akinji light cavalry in 1441. Comparisons with the frequencies of perimortem trauma in 12 other, temporally congruent skeletal series from the Balkans (n = 2,123 skeletons) support this assumption. The role of the akinji in the Ottoman army was twofold: to supply war captives, and to terrorize and disperse local populations before the advance of regular troops. This article tests the hypothesis that the purpose of the 1441 raid was the latter. To accomplish this, perimortem trauma in the series were analyzed by sex, age, location, and depth of the injury. A total of 82 perimortem injuries were recorded in 12 males, 7 females, and 3 subadults. The demographic profile of the victims suggests that young adults were specifically targeted in the attack. Significant sex differences are noted in the number, distribution, and pattern of perimortem trauma. Females exhibit significantly more perimortem injuries per individual, and per bone affected, than males. The morphology and pattern of perimortem trauma in females is suggestive of gratuitous violence. Cumulatively, analysis of the osteological data suggest that the objective of the 1441 akinji raid was to spread terror and panic in the Čepin area, either as revenge for recent military setbacks, or as part of a long-term strategy intended to depopulate the area around Osijek. Am J Phys Anthropol 141:358–372, 2010.

Turkish intrusions into what is today the continental part of Croatia began in 1391 and continued throughout the 15th, and the beginning of the 16th century when a large part of continental Croatia was incorporated into the Turkish Empire. The intrusions were recorded in the following years: 1391, 1396, 1400, 1422, 1423, 1441, 1450, 1494, 1501, and 1512 (Mažuran, 1991). As was typical for Turkish military operations of this time they were carried out by Turkish light cavalry called akinji.

The akinji (the name derives from the Turkish term "akinti" meaning "flood" as they carry and destroy everything in front of them) were irregular light cavalry usually recruited from renegade Christians or Turkish ghazis in Anatolia (Goodwin, 2006). Their function in the Ottoman army was twofold.

The first was supplying war captives that were sold as slaves in the large slave markets of Skopje, Edirne, Bursa, and Istanbul. The Ottoman army, state organization, and some segments of the economy such as the silk industry, agriculture, and distant trade, depended on a regular, and large-scale supply of slaves (Inalcik, 2002). However, because Islamic jurisprudence recognized only one category of slaves—captives of war or those born in slavery, the institution could maintain itself only through constant importation of war captives.

Croatian chroniclers of the 15th century report on the number of captives taken in akinji raids (Mijatović, 2005). Estimates of 30,000 individuals captured in a 1415 raid, and 20,000 captives taken in a raid carried out in 1471 are, most likely, exaggerations if simply because of the logistic complexities of transporting such a large number of captives through 420 km of enemy territory. However, the uniform and repetitive nature of these and other reports clearly shows the importance that the accumulation of captives had in akinji raiding.

The second role of the akinji was related to their extraordinary mobility and fighting proficiency. In this context they were employed as a vanguard force to terrorize and disperse local populations before the advance of regular Ottoman forces (Kruhek, 1995).

Historical sources describe the typical armament of an akinji as including: a saber, war knife, war hammer, mace, spear, and the reflex bow and arrows (Olesnicki, 1938). Although the Ottoman army was one of the first to utilize firearms, their use was not widespread until the beginning of the 16th century. Furthermore cavalry, particularly light cavalry such as the akinji, did not employ firearms, as they were cumbersome and hard to use while mounted.

Systematic archaeological excavations carried out from 1997 to 2006 on the archaeological site Čepin-Turkish cemetery located 11-km southwest of Osijek, revealed the presence of a complex site consisting of a Neolithic, Medieval, and Historic component (Šimić, 1997, 2002, 2004, 2007). The historic component contains a cemetery from which 147 skeletons belonging to individuals who

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inhabited Čepin during its terminal phase were recovered. These skeletons are the focus of this study.

Osteological analyses of the skeletons revealed the presence of a large number (n = 82) of perimortem injuries distributed among males, females, and subadults. Archaeological and historical data suggest that these individuals were victims of a single episode of large-scale violence that occurred at the end of the first half of the 15th century. The purpose of this article is to investigate whether the perimortem injuries recorded in Čepin are likely to have resulted from the historically documented 1441 akinji raid, and if so, whether the injuries are consistent with a raid whose purpose was terrorizing and depopulating the area rather than the accumulation of captives.

To accomplish this, perimortem trauma in the series were analyzed according to the location of the injury, the direction from which the blow was administered, and whether the injury was superficial or penetrated the cranial vault or long bone cortex. These data were compared to historical reports of akinji raids that were undertaken with the aim of acquiring captives, and with those whose objective was spreading terror and panic. The age-at-death of individuals with perimortem injuries was also compared to that of individuals who exhibited no evidence of perimortem trauma to determine whether individuals killed in the raid were a random subsample of the village, or if specific subgroups of the community (children, young adults, the elderly) were targeted in the attack.

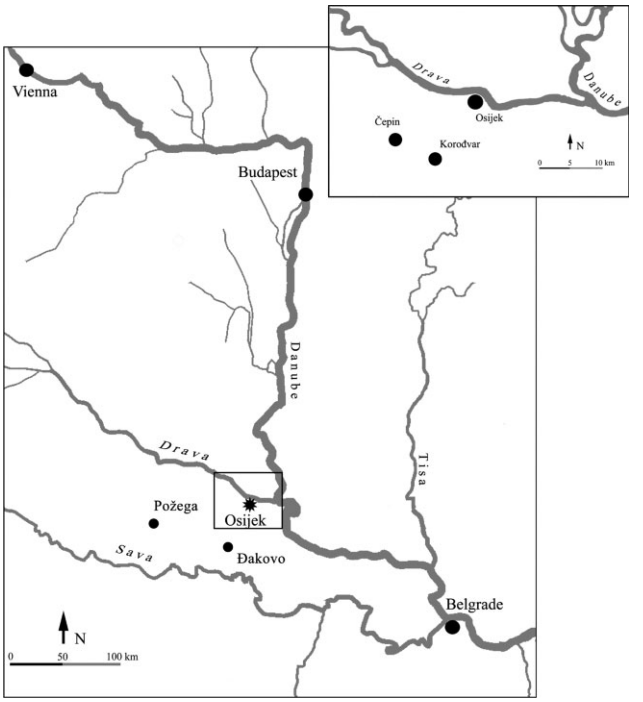

Fig. 1. Map of part of continental Croatia with inset showing the geographical relationships between Čepin, Osijek, and Korođvar.

MATERIALS AND METHODS

During the 15th century Čepin represented the largest village in the estate of the Korog family whose residence, the fortified town of Korođvar was located 4-km southeast of Čepin (see Fig. 1). Historical sources dealing with the 14th and 15th centuries in this part of continental Croatia are fairly comprehensive, particularly those describing episodes of large-scale violence. Five akinji raids were recorded in the first half of the 15th century (in 1400, 1422, 1423, 1441, and 1450). Of these, only the 1441 raid affected the Čepin area (Mažuran, 1991).

Archaeological excavations of the site began in 1997 and continued until 2007. They revealed a complex site consisting of a Neolithic component—inhabited from ~4800 to 4240 BC (Šimić, 2004, 2007), a Medieval component—inhabited from the 11th to the 12th century (Šimić, 1997), and an Historic component—inhabited from the end of the 13th century to the beginning of the 16th century (Šimić, 2002, 2004). The historic component consists of the remains of a building complex that contained an, as yet unidentified church, and an accompanying cemetery. Excavation of this cemetery began in 1997, continued in a campaign that lasted from 2001 to 2003, and finished in 2006. The total extension of the cemetery has been investigated and, as is evident from the horizontal stratigraphy (see Fig. 2), graves with skeletons exhibiting perimortem trauma are randomly dispersed throughout the cemetery. They exhibit the same architecture (all were simple rectangular or oval burial cuts into which wooden coffins were placed), and orientation as the rest of the graves. All of the deceased were oriented in an east (feet) to west (head) direction, with hands that were crossed across the abdomen or pelvic girdle (Šimić, 1997, 2002).

The recovered artifacts were uniformly poor in both sets of graves, and consist of iron nails from the wooden coffins, personal jewelry in the shape of simple rings or earrings, and occasional coins (Šimić, 2004). The vertical stratigraphy of the historic component of the site shows a depth variation of only 0.40 m between the deepest (1.20 m) and shallowest (0.80 m) graves in the cemetery. The depths of graves containing skeletons with perimortem trauma are, however, very uniform. They range from 0.85 to 0.86 m in depth with a maximum difference of 1 cm that was, in all likelihood, caused by variations in topsoil topography. All of these factors suggest that individuals exhibiting perimortem trauma were victims of a single episode of violence. Radiocarbon dating of two skeletons located on opposite ends of the cemetery that exhibit perimortem trauma support this assumption. The returned dates from the Leibniz Laboratory for Radiometric Dating and Stable Isotope Research in Kiel Germany significantly overlap. The calibrated age range for the internment of the individual recovered from grave 76 (with a probability of 95.4%) is between 1423 and 1452, the calibrated age range for the internment of the individual recovered from Grave 5 (with a probability of 95.4%) is between 1414 and 1443. These age ranges suggest a total time span for the attack on Čepin between 1414 and 1452, and overlap between the years 1423 and 1443.

Because only two of the 22 individuals with perimortem trauma were radiocarbon dated, an additional analysis was made to control that individuals with perimortem trauma in Čepin were, indeed, victims of the 1441 akinji raid, and not other historically unrecorded skirmishes or local intra- or intercommunity conflicts. The frequencies of perimortem trauma in Čepin were compared to the frequencies of perimortem trauma in

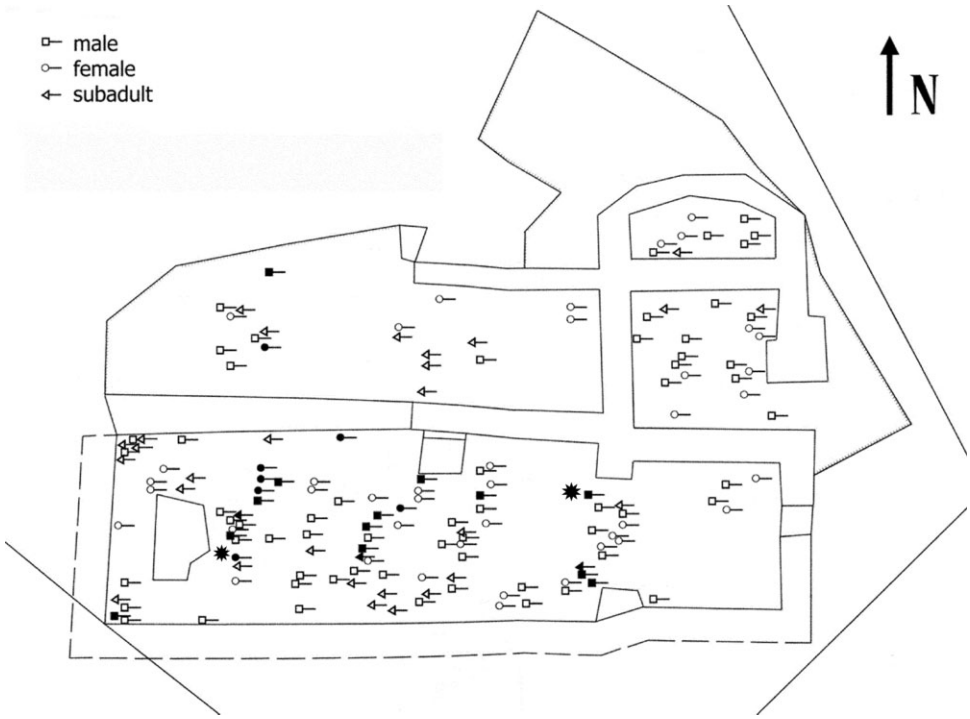

Fig. 2. Plan of the historic period cemetery in Čepin. Shaded symbols represent individuals with perimortem trauma, * marks graves used for radiocarbon dating.

other, temporally congruent skeletal series from the Balkans. The series derive from archaeological sites that encompass the time period from the 6th to 17th centuries with the majority of the sites covering the time span from the 14th to 17th century. The skeletal series are from Croatia (Mikić, 1983; Šlaus 2000, 2008; Šlaus et al., 2002, 2007; Novak et al., 2007), Serbia (Živanović, 1985, 1986, 1987; Vlak, 2006), and Bosnia and Herzegovina (Pilarić, 1969). The large number of skeletons analyzed in these series (n = 2,123) suggests that the analyzed sites accurately depict the risk of acquiring perimortem trauma during the medieval/historic time periods in the Balkans. As there are no historical data suggesting that the past inhabitants of Čepin differed from their contemporaries, significantly higher frequencies of perimortem trauma in Čepin should indicate that its inhabitants were victims of the 1441 akinji raid.

On the assumption that individuals with perimortem trauma were victims of the 1441 akinji raid, the fact that they were buried in the established village cemetery, in individual graves, and in the same manner as the other deceased, suggests that some inhabitants of the village survived the attack, and returned to bury their dead. To test whether individuals with perimortem injuries were left unburied for a longer period of time, skeletons with perimortem trauma were analyzed for the presence of carnivore activity according to criteria described by Haynes (1980), Lyman (1996), and Haglund (1997). No signs of puncture marks caused by canines, scoring, furrows, ragged, or polished ends of long bones were noted. The breakage of the long bones had not left longitudinally split fragments or channeled breakage typical of animal destruction, and the preservation of the small bones from the hands or feet was similar to the preservation of these bones in individuals with no evidence of perimortem trauma. Cumulatively, these data suggest that the deceased were buried shortly after they had been killed. On the assumption that individuals with perimortem trauma were victims of the 1441 akinji raid, the hypothesis that the site continued to be occupied after the attack is supported by the recovery of two silver denars minted after 1488 (Šimić, 2004). The site was, however, abandoned sometime during the early 16th century when this part of Croatia was incorporated into the Turkish Empire.

Preservation of the osseous material from the historic period cemetery is generally good. The bones are a homogeneous light brown-yellow color, and are reasonably well preserved. However, because of subsequent scavenging of the site for building material, and the digging of a defensive trench during the 1991 War in Croatia, the completeness of some of the recovered skeletons is poor. Skeletal material from the historic period series is part of the Osteological collection of the Croatian Academy of Sciences and Arts. The material is curated in Zagreb where it was analyzed for the presence of trauma.

Injuries to bone are identified as either antemortem, perimortem, or postmortem and are identified by the characteristics of the fracture margins (Merbs, 1989; Sauer, 1998). Antemortem injuries are defined as nonlethal wounds that occurred earlier in an individual's life, and are identified by the presence of healing around the wound. Perimortem injuries are those that occur at or near the time of death, and are identified by the absence of healing, and fracture margins that are characteristic of fresh bone breaks. Postmortem injuries occur after an individual's death. They exhibit different fracture margins than perimortem wounds that are usually lighter in color than the surrounding bone. They can be caused by a variety of factors including ground

pressure, plant roots, carnivore or rodent gnawing, and equipment damage.

All bones were analyzed for the presence of three types of trauma: projectile injuries, blunt force, and sharp force trauma.

Injuries caused by projectile points can exhibit characteristics of sharp, projectile and/or blunt trauma, depending on their velocity and trajectory (Steadman, 2008). Penetrating wounds exhibit internal and external beveling (Berryman and Symes, 1998), while partially penetrating wounds have depressed, comminuted fractures caused by the crushing of bone at the impact site (Milner et al., 1991). Cut marks can occur if the point of the projectile skims across bone (Lambert, 1997; Steadman, 2008).

Blunt force trauma is usually caused by a relatively low-velocity impact over a relatively large surface area and is typically produced through contact with a blunt instrument or during falls (Galloway et al., 1999). It is identified by the presence of plastic deformation, fractures radiating from an impact site, or concentric fractures exhibiting an internal bevel (Berryman and Symes, 1998). Sometimes, the wound is characterized by "delamination" of the inner table of the skull, resulting in a fragment with only an outer table and diploë (Spitz, 1980).

Sharp force trauma is produced by bladed instruments. It is identified by the presence of linear lesions with well-defined sharp edges that have flat, smooth, and polished cut surfaces that are present on both sides of the bone if the weapon entered in a right angle, or only on the obtuse-angled side if the weapon entered at another angle (the acute side in these cases usually shows signs of flaking). The lesions exhibit a v-shaped crosssection, and macroscopically or microscopically visible parallel striations perpendicular to the kerf floor (Houck, 1998; Reichs, 1998; Symes et al., 1998; Kjellström, 2005).

All perimortem trauma were analyzed for location (anterior or posterior part of the skeleton), and side (left, right or parasagittal). The depth of the injury—whether it was superficial or had penetrated the bone was also recorded. The criteria for penetrating injuries of the cranium were that both tabula interna and externa had to be intersected, on long bones the cortex had to be intersected. Sharp force trauma was classified as slashing or stabbing. Being deeper than they are wide, and manifest as a puncture with an eburnated margin identifies stabbing wounds. Slashing injuries are wider than deep and in other respects conform to criteria for identification of sharp force trauma (Novak, 2000). The angle and the striation of the cut surfaces were used as indicators of the direction (from above, below, or perpendicular to the bone) of the blow (Boylston, 2000).

All skeletal elements were examined macroscopically, and those with perimortem trauma under 10–30× magnification. Each injury was photographed and documented on a distribution diagram. At this point it must be noted that as only injuries that affected bone can be recorded, this analysis will underestimate the real number of injuries suffered by the inhabitants of Čepin.

Perimortem injuries in the series are analyzed by individual, anatomical segment (cranium including the cervical vertebrae, thorax, upper extremities, and lower extremities), and bone. The denominator will vary depending on the number of well-preserved elements. For the purposes of this analysis the cranium and cervical vertebrae were considered well-preserved if the frontal bone, both parietals, the occipital, the mandible and at least four cervical vertebrae were present. The thorax was considered well-preserved if both clavicles, the sternum, both scapulae, both innominates, the sacrum, and at least nine thoracic and three lumbar vertebrae were present. The upper extremities were considered well-preserved if both humerii, radii, and ulnae were present, and the lower extremities were considered well-preserved if both femurs, tibiae, and fibulae were present. Chi-square tests determined statistically significant variations in the presence of injury between the bones, body segments, and sexes.

The analyzed remains were aged and sexed according to the following criteria. Sex was determined based on pelvic (Bass, 1987) and cranial (Krogman and Işcan, 1986) morphology. When these elements were missing or poorly preserved discriminant functions for the femur (Šlaus, 1997) and tibia (Šlaus and Tomičić, 2005) developed for antique and medieval Croatian populations were employed. No attempt was made to estimate the sex of subadult individuals.

Adult age at death was estimated using as many methods as possible, including pubic symphysis morphology (Brooks and Suchey, 1990), auricular surface morphology (Lovejoy et al., 1985), sternal rib end changes (Işcan et al., 1984, 1985), and ectocranial suture fusion (Meindl and Lovejoy, 1985). In subadult remains, age at death was estimated using epiphyseal fusion, diaphyseal lengths, and dental eruption criteria (McKern and Stewart, 1957; Moorrees et al., 1963; Bass, 1987; Scheuer and Black, 2000). Adults were aged into one of three composite adult age categories: young adults falling between ages 15 and 29, middle adults falling between ages 30 and 44, and older adults comprising an open ended 45+ category. Subadults were aged into one of four age categories: 0.0–0.9; 1.0–3.9; 4.0–9.9; and 10.0–14.9.

RESULTS

The total historic period series consist of 147 individuals: 70 males (47.6% of the total sample), 50 females (34.0% of the total sample), and 27 subadults (18.4% of the total sample). The subadult sample is underrepresented in the series, and as is frequently the case, this underrepresentation is the result of the small number of subadults from the two youngest age categories (birth to 3.9 years). Ten individuals (37.0% of the subadult subsample, but only 6.8% of the total sample) from the historic period series were aged less than 4 years.

Twenty-two individuals (15.0% of the total sample) exhibit perimortem trauma: 12 males (17.1% of the male subsample), 7 females (14.0% of the female subsample), and 3 subadults (11.1% of the subadult subsample). The male: female: subadult ratio in this subsample (1.00: 0.58: 0.25) is thus very similar to the male: female: subadult ratio of the complete historic period series (1.00: 0.71: 0.39), suggesting that subadults were not specifically targeted in the attack on Čepin.

Comparison with other, temporally congruent, skeletal series shows that high frequencies of individuals with perimortem injuries are by no means a common feature of Balkan skeletal series (Table 1). The number of individuals exhibiting perimortem trauma in Čepin (22/147) is more than twice as high as the total number of individuals with perimortem trauma from the other 12 series (9/2123). Perimortem injuries were recorded in only

TABLE 1. Comparative rates of individuals with perimortem injuries in skeletal series from the Balkans[a]

Site	Males		Females		Subadults		Total	
	N/N_{pmt}	%	N/N_{pmt}	%	N/N_{pmt}	%	N/N_{pmt}	%
Čepin 13-16 c., Croatia	70/12	17.1	50/7	14.0	27/3	11.1	147/22	15.0
Nova Rača 14-18 c., Croatia	35/0	0.0	33/0	0.0	36/0	0.0	104/0	0.0
Zagreb 14-16 c., Croatia	95/0	0.0	42/0	0.0	32/0	0.0	169/0	0.0
Koprivno Klis 15-18 c., Croatia	27/0	0.0	33/0	0.0	86/0	0.0	146/0	0.0
Ričice Imotski 14-15 c., Croatia	48/0	0.0	35/0	0.0	62/0	0.0	145/0	0.0
Composite sample from continental Croatia 6-9 c.	70/1	1.4	75/1	1.3	30/0	0.0	175/2	2.7
Composite sample from continental Croatia 10-13 c.	60/0	0.0	62/0	0.0	53/0	0.0	175/0	0.0
Composite sample from Adriatic Croatia 7-9 c.	100/6	6.0	100/0	0.0	64/0	0.0	264/6	1.1
Niš 12-13 c., Serbia	31/0	0.0	24/0	0.0	19/0	0.0	74/0	0.0
Deževo 14-15 c., Serbia	26/0	0.0	20/0	0.0	10/0	0.0	56/0	0.0
Trgovište 15-16 c., Serbia	201/1	0.5	112/0	0.0	139/0	0.0	452/1	0.2
Tabačina 15-17 c., Serbia	93/0	0.0	61/0	0.0	43/0	0.0	197/0	0.0
Gomjenica 10-11 c., Bosnia and Herzegovina	48/0	0.0	60/0	0.0	58/0	0.0	166/0	0.0

[a] N = number of individuals observed; N_{pmt} = number of individuals with perimortem trauma.

three other skeletal series (two from Croatia, and one from Serbia), and in none of these was the total frequency of individuals with perimortem trauma higher than 2.3%. Additionally, Čepin is the only series in which more than one female exhibits perimortem injuries, and the only one in which perimortem trauma were recorded in subadults. These data strongly suggest that individuals exhibiting perimortem trauma from Čepin were, indeed, victims of the historically documented 1441 akinji raid.

Comparisons between the ages-at-death of adults with perimortem injuries, and those who exhibited no evidence of perimortem trauma suggest that young adults were specifically targeted in the attack. Perimortem trauma frequencies in Čepin by sex and age are presented in Table 2. The presence of perimortem trauma in both the total adult sample ($\chi^2 = 7.90$, df = 2, $P = 0.019$), and the female subsample ($\chi^2 = 6.93$, df = 2, $P = 0.031$) is significantly associated with younger age categories. The same trend is present in the male subsample although in this case the association is not significant ($\chi^2 = 2.85$, df = 2, $P = 0.241$).

An important difference between males and females in the series concerns the number of perimortem injuries they suffered (Table 3). The total number of perimortem injuries recorded in females ($n = 52$) is more than twice as high as total number of perimortem injuries recorded in males ($n = 25$). The highest number of perimortem injuries recorded in a male is eight, while the most frequently recorded number is one (recorded in seven individuals). In contrast to this, the highest number of injuries recorded in a female is 22, and only one female exhibits a single perimortem injury. These differences are also reflected in the different mean numbers of perimortem injuries recorded in males—2.1, and females—7.4.

The distribution of trauma by anatomical segment is presented in Table 4. In both males and females the most frequent location of perimortem injuries is in the cranium and cervical vertebrae. Slightly less than a third (8/25 or 32.0%) of all perimortem injuries recorded in males are located on the cranium, and one perimortem injury is located on the first cervical vertebra. Females exhibit an even higher number (28/52) of perimortem injuries to the cranium (no perimortem injuries were recorded on the cervical vertebrae of females), as well as a higher frequency (53.9%) of injuries to this part of the body than males. The difference is not, however, significant ($\chi^2 = 1.50$, df = 1, $P = 0.22$). The frequencies of injuries to the thorax and lower extremities are similar in both sexes, but injuries to the upper extremities are significantly more frequent in males than in females (5/25 or 20.0% compared to 2/52 or 3.8%; $\chi^2 = 3.55$, df = 1, $P = 0.05$).

TABLE 2. The frequency and distribution of perimortem trauma in adults by age and sex[a]

Age (years)/sex	Perimortem trauma	
	O/A	%
Males 15–29	15/4	26.7
Males 30–44	29/6	20.7
Males 45+	26/2	7.7
All males	70/12	17.1
Females 15–29	11/4	36.4
Females 30–44	25/3	12.0
Females 45+	14/0	0.0
All females	50/7	14.0
All adults 15–29	26/8	30.8
All adults 30–44	54/9	16.7
All adults 45+	40/2	5.0
All adults	120/19	15.8

[a] O = number of individuals observed; A = number of individuals with perimortem trauma.

There is no evidence of blunt force trauma or projectile injuries in the series. Sharp-edged weapons inflicted all injuries, with the exception of one penetrating injury to the right ilium that may have been inflicted with the beak of a war hammer.

Perimortem injuries in males are recorded in the cranium and cervical vertebrae, the thoracic area, and both the upper and lower extremities.

Four of the 10 males with well preserved crania and cervical vertebrae exhibit a total of nine sharp force trauma in this part of the skeleton (Table 5 and Fig. 3). The average number of wounds per affected cranium and cervical vertebrae is 2.2, and for all well preserved crania and cervical vertebrae 0.9. Eight bones exhibit perimortem injuries giving a wounds/per bone affected ratio of 9/8 or 1.1.

Seven blade wounds are located on the cranium, one bisects the right mandibular ramus, and one sliced through the inferior articular facets of the first cervical vertebra. Most of the wounds in the cranium and cervical vertebrae are located on the posterior (7/9), and right (6/9) side of the skeleton.

TABLE 3. The number of perimortem trauma in Čepin by sex and age

Males		Females		Subadults	
Age	Numb. of perimortem trauma	Age	Numb. of perimortem trauma	Age	Numb. of perimortem trauma
15–29	8	15–29	22	1.0–3.9	2
15–29	1	15–29	6	4.0–9.9	2
15–29	1	15–29	4	10.0–14.9	1
15–29	3	15–29	8		
30–44	1	30–44	2		
30–44	2	30–44	9		
30–44	1	45+	1		
30–44	1				
30–44	1				
30–44	3				
45+	2				
45+	1				
Total number of perimortem trauma = 25 Mean number of perimortem trauma in males = 2.1		Total number of perimortem trauma = 52 Mean number of perimortem trauma in females = 7.4		Total number of perimortem trauma = 5 Mean number of perimortem trauma in subadults = 1.7	

TABLE 4. The distribution of perimortem trauma in Čepin by anatomical segment

	Cranium and neck	Thorax	Upper extremities	Lower extremities	Total
Males					
No. of ind. with preserved segment	10	10	10	11	12 males
No. of ind. with perimortem trauma	4	2	2	6	
No. of perimortem trauma (*N*, %)	9 (36.0)	4 (16.0)	5 (20.0)	7 (28.0)	25 (100.0)
Females					
No. of ind. with preserved segment	6	5	6	6	7 females
No. of ind. with perimortem trauma	5	1	1	1	
No. of perimortem trauma (*N*, %)	28 (53.9)	9 (17.3)	2 (3.8)	13 (25.0)	52 (100.0)
Subadults					
No. of ind. with preserved segment	2	2	2	3	3 subadults
No. of ind. with perimortem trauma	0	2	1	0	
No. of perimortem trauma (*N*, %)	0	3 (60.0)	2 (40.0)	0	5 (100.0)
Total					
No. of ind. with preserved segment	18	17	18	20	22 individuals
No. of ind. with perimortem trauma	9	5	4	7	
No. of perimortem trauma (*N*, %)	37 (45.1)	16 (19.5)	9 (11.0)	20 (24.4)	82 (100.0)

TABLE 5. Distribution and characteristics of perimortem trauma on the cranium in males

	Cranial elements with perimortem trauma						
	Frontal (*n* = 1)	Left parietal (*n* = 1)	Right parietal (*n* = 3)	Right temporal (*n* = 1)	Mandible (*n* = 1)	C1 (*n* = 1)	Total (*n* = 8)
Numb. of trauma	1	1	4	1	1	1	9
Anterior[a]	1		1				2
Posterior		1	3	1	1	1	7
Left	1	1					2
Right			4	1	1		6
Parasagittal						1	1
Penetrating				1	1	1	3
Superficial	1	1	4				6
Blow from above		1	3				4
Blow from below	1		1				2
Horizontal blow				1	1	1	3

[a] Anterior or posterior in relation to the external auditory meatus.

The most often affected cranial bones are the parietals. Only one frontal bone is affected, and no occipital bones exhibit evidence of perimortem trauma. Six of the nine sharp force injuries that affected the cranium and cervical vertebrae are superficial cuts that did not penetrate the cranial vault. One blade wound severed the inferior right mastoideus, and at the same time bisected the right mandibular ramus. A horizontal cut (with striations on the cut surface suggesting that the direction of the blow was dorso-ventral) that sliced through both inferior articular facets of the first cervical vertebra was also noted.

Postcranial injuries in males are located on the clavicles, right radius, left ulna, proximal phalange of the middle finger of the left hand, femurs, and left tibia

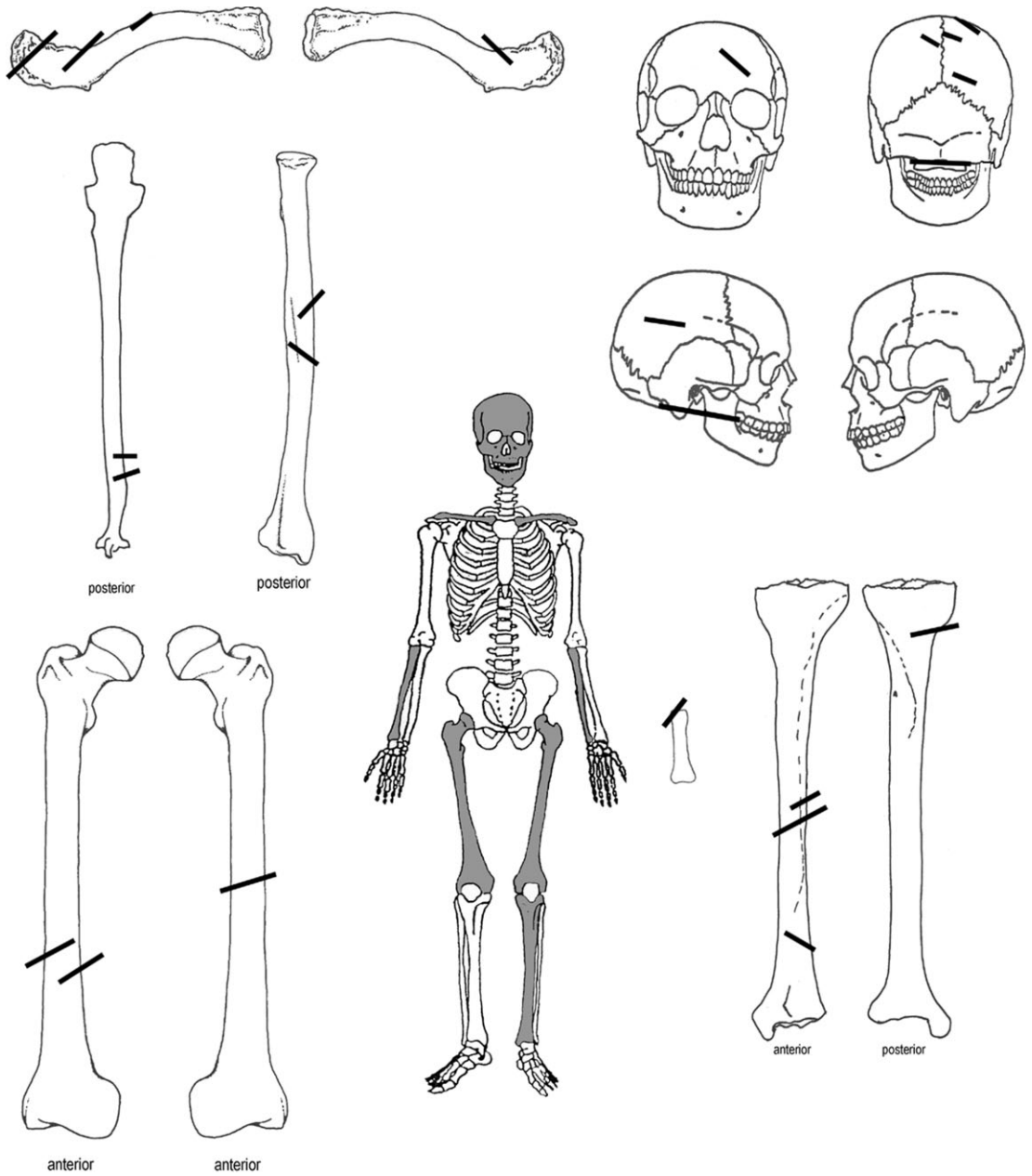

Fig. 3. Distribution of perimortem injuries on the skeletons of males. Shaded bones exhibit injuries.

(Table 6 and Fig. 3). A total of 16 injuries is recorded, nine located above, and seven below the waist. Eleven bones are affected giving a wounds/per bone affected ratio of 16/11 or 1.4. Together with injuries to the cranium and cervical vertebrae, the total wounds/per bone affected ratio in males is 25/19 or 1.3.

Four blade wounds are located in the thoracic area, five are located in the upper, and seven are located in the lower extremities.

Most of the postcranial wounds are located on the anterior (10/16) side of the skeleton. There is no clear preference for the left or right side—nine injuries are recorded on the left, and seven on the right side of the skeleton. The majority of postcranial injuries (12/16) are superficial cuts.

Perimortem injuries in females are recorded in the cranium and cervical vertebrae, the thoracic area, and both the upper and lower extremities.

Five of the six females with well preserved crania and cervical vertebrae exhibit a total of 28 sharp force trauma in this part of the skeleton (Table 7 and Fig. 4). The average number of wounds per affected cranium and cervical vertebrae is 5.6, and for all well preserved crania and cervical vertebrae 4.7. Nine bones exhibit perimortem injuries giving a wounds/per bone affected ratio of 28/9 or 3.1.

There is no evidence of perimortem injuries on the cervical vertebrae or the mandible in females. All sharp force trauma is located on the cranial vault. Anterior (15/28) and posterior wounds (13/28) are evenly distrib-

TABLE 6. Distribution and characteristics of perimortem trauma on the postcranial skeleton in males

	Postcranial elements with perimortem trauma								
	Left clavicle (n = 1)	Right clavicle (n = 1)	Right radius (n = 1)	Left ulna (n = 1)	Prox. phalange middle finger left hand (n = 1)	Left femur (n = 1)	Right femur (n = 2)	Left tibia (n = 3)	Total (n = 11)
Numb. of trauma	1	3	2	2	1	1	2	4	16
Anterior	1	3				1	2	3	10
Posterior			2	2	1			1	6
Left	1			2	1	1		4	9
Right		3	2				2		7
Parasagittal									–
Penetrating		1			1			2	4
Superficial	1	2	2	2		1	2	2	12
Blow from above		1	–	–	–		2	3	6
Blow from below			–	–	–	1		1	2
Horizontal blow	1	2	–	–	–				3

TABLE 7. Distribution and characteristics of perimortem trauma on the cranium in females

	Cranial elements with perimortem trauma				
	Frontal (n = 3)	Left parietal (n = 3)	Right parietal (n = 2)	Left temporal (n = 1)	Total (n = 9)
Numb. of trauma	11	10	6	1	28
Anterior[a]	11	1	3		15
Posterior		9	3	1	13
Left	10	10		1	21
Right	1		6		7
Parasagittal					–
Penetrating					–
Superficial	11	10	6	1	28
Blow from above	7	4	3	1	15
Blow from below		1			1
Horizontal blow	4	5	3		12

[a] Anterior or posterior in relation to the external auditory meatus.

uted, but there is a clear preference for the left (21/28) side of the skull. Females exhibit considerably more (11/28) injuries to the left frontoparietal region of the skull than males (1/9), but the difference is not significant (χ^2 = 1.35, df = 1, P = 0.24).

The most often affected cranial bones are the frontal bone, and the left parietal. None of the sharp force injuries that affect the skull penetrated the cranial vault.

Perimortem injuries to the cranium in females differ from those inflicted on males in that there appears to be an element of gratuitous violence in them. Because the term "gratuitous" is both subjective and vague, to define it we will employ criteria used in modern forensic settings. In an analysis of homicides committed by 18 psychopathic and 20 nonpsychopathic modern Canadian offenders, Porter et al. (2003) defined gratuitous violence as "... excessive, or unnecessary violence that goes beyond the level that would be necessary to accomplish homicide, and causes the victim unnecessary pain and suffering" (Porter et al., 2003 p 463). The primary criteria for this type of violence are evidence of torture/beating, mutilation or "overkill," and the use of multiple weapons on one victim. The morphology, pattern, and distribution of perimortem injuries in female crania meet most of these criteria.

Five females in Čepin exhibit perimortem injuries to the cranium. Suggestive of the presence of "overkill" is the fact that only one individual has a single perimortem injury, while four individuals exhibit between four to nine perimortem injuries. Evidence of possible torture or mutilation in the female subsample is seen in the presence of four perimortem injuries (located in the facial areas of two females) that are concentrated in the area of the superior left orbit, and may have been inflicted while gouging out the eye. One of these individuals exhibits a total of six relatively short (the longest is 29 mm) parallel cuts, five of which are located on the left part of her frontal bone while one is located on the left nasal bone (see Fig. 5). The other individual has four shallow cuts, three located on the left side of the frontal bone, and one located on her left mastoideus. Additional evidence for either torture, mutilation, or "overkill" is present in a 15- to 29-year old female who has eight parallel short cuts located on her posterior left parietal, and in a 30- to 44-year old individual who exhibits nine shallow cuts that circumvent the cranial vault. The cuts are located on the frontal (n = 2), right parietal (n = 5), and left parietal (n = 2) bones. In appearance they are reminiscent of scalping marks with, however, the important difference that 8/9 cuts are vertically oriented.

Postcranial injuries in females are located on the left radius, innominates, and right femur (Table 8 and Fig. 4). A total of 24 injuries is recorded, two located above, and 22 below the waist. This distribution is significantly different from the almost equal number of postcranial wounds recorded above (n = 9), and below (n = 7) the waist in males (χ^2 = 8.78, df = 1, P = 0.003).

Four bones are affected giving a wounds/per bone affected ratio of 24/4 or 6.0. Together with injuries to the cranium, the total wounds/per bone affected ratio in

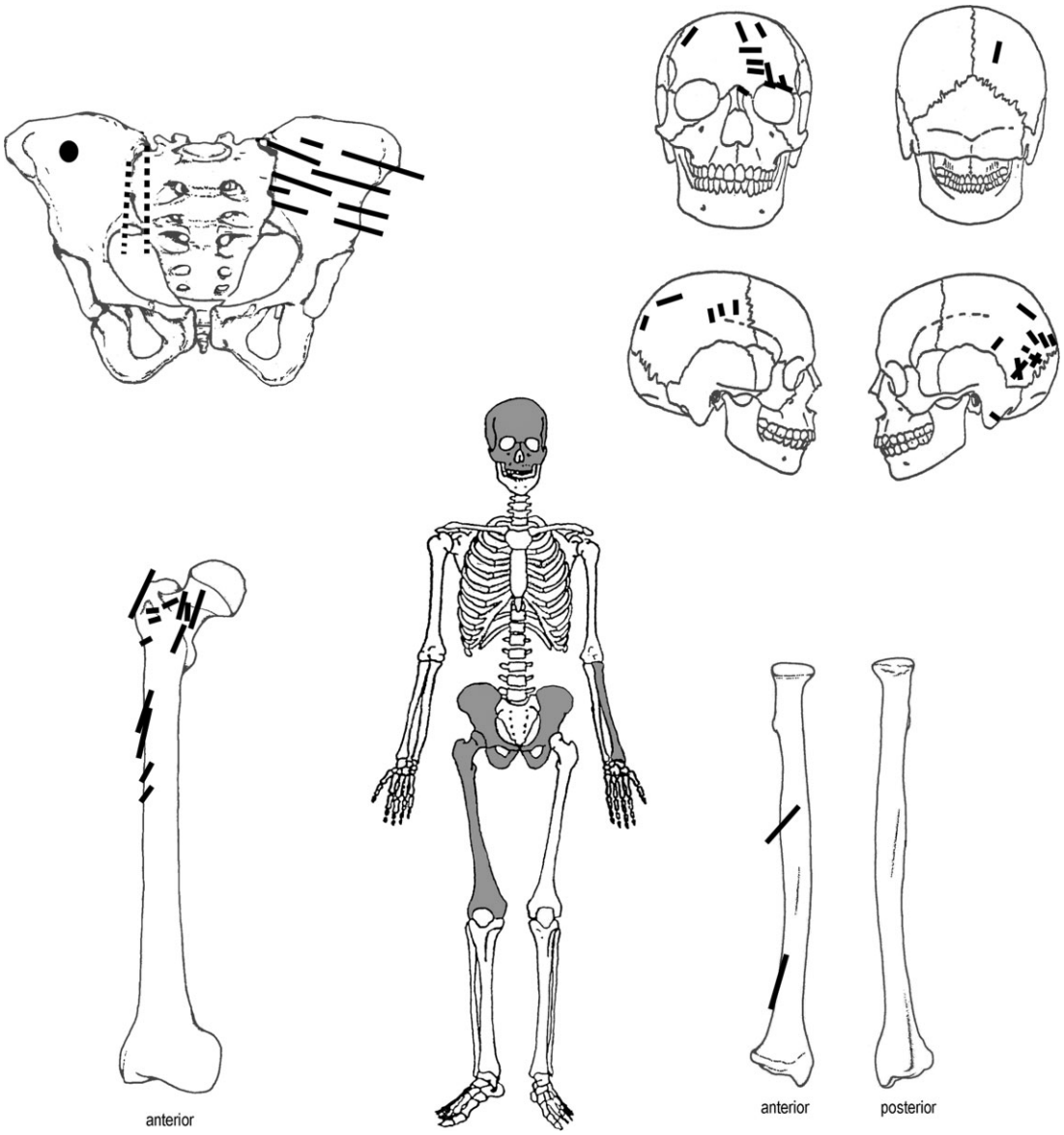

Fig. 4. Distribution of perimortem injuries on the skeletons of females. Shaded bones exhibit injuries.

females is 52/13 or 4.0. This is significantly higher than the total wounds/per bone affected ratio recorded in males (25/19 or 1.3, $\chi^2 = 5.73$, df = 1, $P = 0.017$).

Nine perimortem injuries, eight of which are sharp force trauma while one is a penetrating injury, are located in the thoracic area, two are located in the upper, and 13 are located in the lower extremities.

Unlike males where nine individuals exhibit a total of 16 postcranial perimortem injuries, postcranial perimortem trauma in the female subsample is present in only two individuals. One individual has two injuries on her left radius. The second has 22 postcranial perimortem injuries, all of which are located on her innominates and proximal right femur (see Fig. 6). The most inferior cut is located on the antero-lateral side of the right femur, 101-mm inferior of the lesser trochanter, while the most superior injury is located 14-mm inferior of the left iliac crest. All 22 injuries are, therefore, concentrated in an area of the skeleton that is ~270-mm long.

All injuries are sharp force trauma except for the penetrating injury on the right ilium. This injury (located 33-mm inferior of the iliac crest) is roughly oval in shape and exhibits slight beveling on the posterior surface. Experiments carried out by two authors (M.Š. and V.V.) with Ottoman Turkish weapons curated at the History Museum in Zagreb, according to suggestions made by Novak (2000; p 97) when she was attempting to identify the weapons used to inflict the puncture wounds in Towton by comparing them with the profiles of the wounds, suggest that this injury may have been produced with the beak of a war hammer.

Sharp force trauma is present on the right femur that has 13 cuts, eight of which were inflicted from below while five were inflicted from above. The right ilium has two cuts, a shorter (25 mm), and a longer (58 mm) cut that sliced off the posterior-medial part of the right ilium, both of which were inflicted from below. The left ilium exhibits six shallow, roughly parallel cuts on its

anterior surface that were inflicted from above. Because of the concave nature of the anterior iliac surface 3/6 cuts are discontinuous. It is, however, clear that each injury was the result of a single action, most likely a horizontal cut through the left abdominal area of the victim with a war knife whose point scraped along the anterior iliac surface.

The morphology and pattern of postcranial perimortem injuries in Čepin females is also consistent with the presence of gratuitous violence. The 22 injuries in the general pelvic area of a single individual are clear evidence of "overkill." Additionally, at least three types of weapon were used on this individual—an unidentified weapon (possibly the beak of a war hammer) that produced the penetrating injury on the right ilium, a saber that inflicted a deep cut on the posterior left ilium and sliced of its posterior-medial part, and a war knife whose tip produced six parallel, discontinuous lines on the anterior surface of the left ilium.

Three subadults in the series also exhibit five perimortem injuries. Three are recorded in the thoracic area. Two sharp force trauma (one penetrating, and one superficial) are present on the posterior side of the left scapula of a 4.0- to 9.9-year old subadult, while one sharp force trauma (penetrating) is located on the posterior side of the right scapula of a 10.0- to 14.9-year old subadult. Two injuries are located in the upper extremities. A 1.0- to 3.9-year old subadult has two deep, penetrating sharp force injuries on the anterior side of his right humerus.

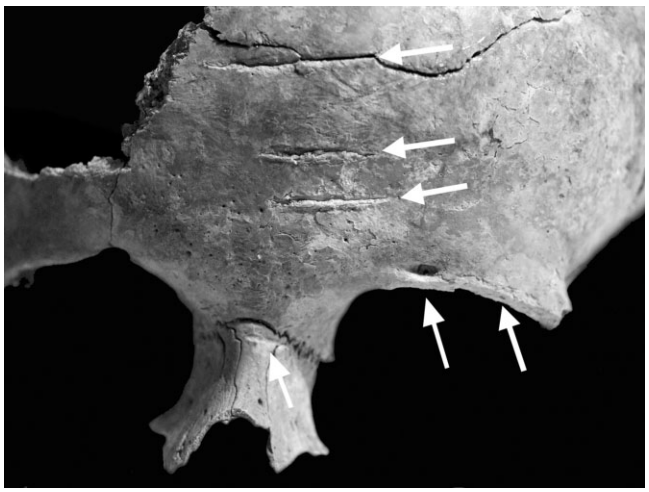

Fig. 5. Sharp force perimortem injuries to the frontal bone of the 15- to 29-year old female recovered from Grave No. 2.

DISCUSSION

The high frequency of individuals with perimortem trauma in Čepin in comparison to other, temporally congruent skeletal series from the Balkans, strongly suggests that individuals with perimortem trauma in Čepin were, indeed, victims of the historically documented 1441 akinji raid. The possibility that these individuals were victims of other, historically unrecorded skirmishes seems unlikely, as the low frequencies of individuals with perimortem injuries in the other 12 skeletal series from the Balkans suggests that these conflicts were extremely rare. Additionally, there is no reason why these skirmishes would go unrecorded, while the 1441 raid was documented in historical sources.

The possibility that, at least some, of these individuals were victims of local intra- or intercommunity violence is also unlikely given the low frequencies of individuals with perimortem injuries in the other skeletal series, and the fact that the morphology of the majority of the perimortem injuries in the series indicates that they were slashing injuries most likely inflicted with a saber or a sword. During the Medieval and Historic periods the carrying of sabers or swords was related not only to an individual's self-defense, but also to his social status. Serfs were, for instance, forbidden to carry arms, and even free villagers were denied this right up to the middle of the 16th century when the military border between Croatia and the Ottoman Empire began to be fortified and manned with standing troops (Adamček, 1980). Historical sources from the 15th century report that Čepin comprised of 31 households, 23 of which belonged to serfs, while eight were either free villagers, or households with no taxable income (Mažuran, 1994). Because of their social status, none of these individuals would have been allowed to carry swords or sabers. An even greater percentage of serf households are recorded in neighboring villages. The assumption, therefore, that individuals with perimortem injuries in Čepin were victims of low-level endemic violence caused by internal conflicts, or conflicts with the inhabitants of neighboring communities, seems unlikely.

Numerous contemporary European sources described akinji raids and the effect they had on local populations. The modus operandi of the akinji raiders when they were primarily concerned with spreading terror in order to depopulate an area prior to the arrival of regular

TABLE 8. Distribution and characteristics of perimortem trauma on the postcranial skeleton in females

	Postcranial elements with perimortem trauma				
	Left radius (n = 1)	Left innominate (n = 1)	Right innominate (n = 1)	Right femur (n = 1)	Total (n = 4)
Numb. of trauma	2	6	3	13	24
Anterior	2	6	1	13	22
Posterior			2		2
Left	2	6			8
Right			3	13	16
Parasagittal					–
Penetrating	1		3	5	9
Superficial	1	6		8	15
Blow from above	–	6		5	11
Blow from below	–		2	8	10
Horizontal blow	–		1		1

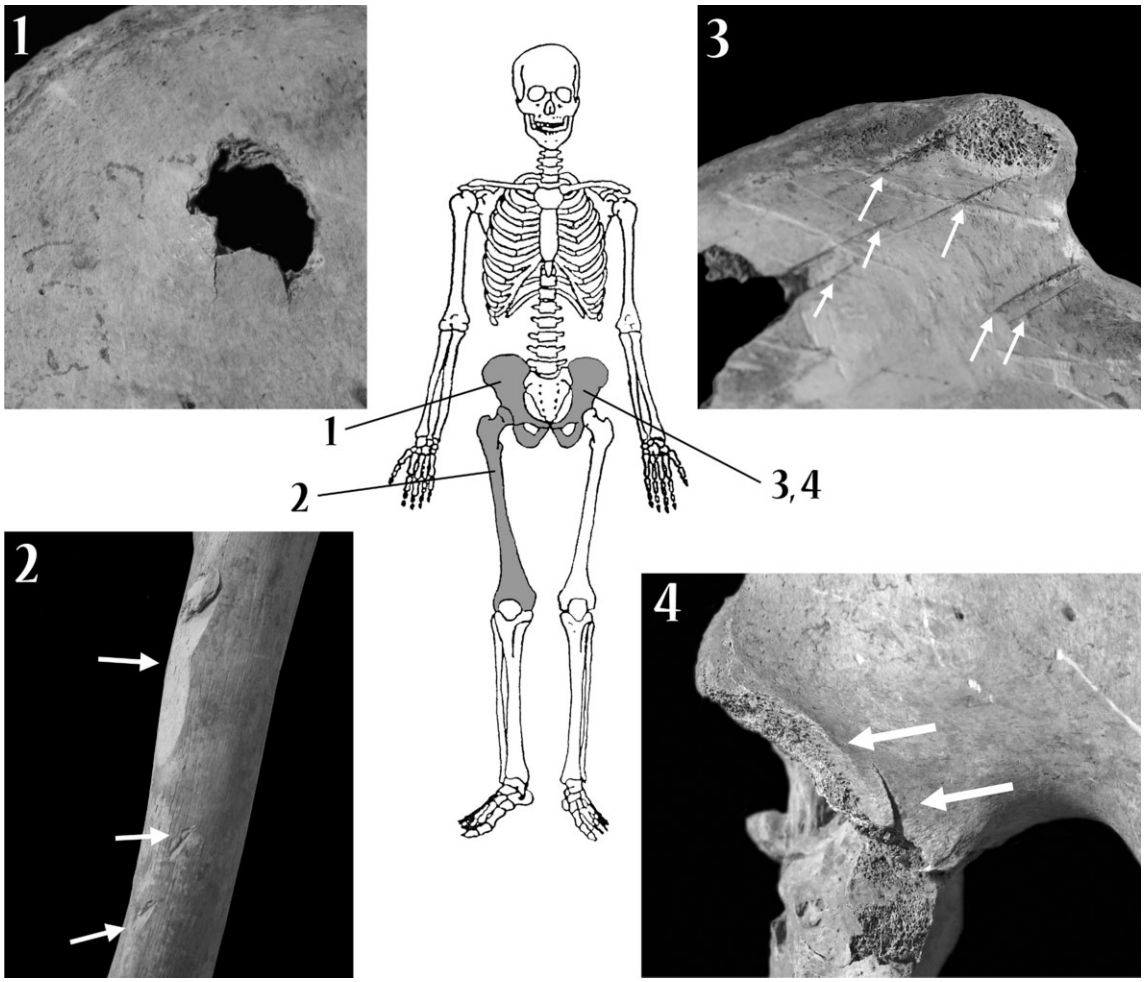

Fig. 6. Perimortem injuries to the postcranial skeleton of the 15- to 29-year old female recovered from Grave No. 76. Shaded bones exhibit injuries. 1) Dorsal view of the penetrating injury to the right ilium; 2) Sharp force trauma to the right femur. All of the injuries shown were inflicted from below; 3) Six shallow perimortem injuries on the anterior side of the left ilium; 4) Two deep blade wounds on the posterior right ilium. Both were inflicted from below.

Ottoman forces is described by the 15th century Croatian bishop Juraj Divinić. He states that: "... (the akinji) destroy houses, towns ... violate women and virgins ... and torture in unimaginable ways those unfortunate enough to be captured ..." (Mijatović, 2005; p 25).

Similarly, Peter Stern von Labach, the 16th century Austrian chronicler describing atrocities committed by the akinji who surrounded Vienna during its first siege by the Turks in 1529 notes: "... after the taking of (the town) Bruck on the Leitha, and the castle of Trautmannsdorf ... (the akinji) spread themselves far and wide over the country, as far as the Ens and into Styria, burning and slaying. Many thousands of people were murdered, or maltreated ... children were cut out of their mothers' wombs and stuck on pikes; young women abused to death, and their corpses left on the highway" (Stern, 1529).

The modus operandi of the akinji when the primary goal of their raid was the accumulation of war captives is described in a remarkable document written at the end of the 15th century by Konstantin Mihailović. Mihailović was a Serb forcibly conscripted into the janissary corps after the subjugation of Kosovo by the Turks. Eventually he was captured by the Hungarians, and repatriated. In his book "Memoirs of a janissary" he describes his involvement in the Turkish wars, and the organization and function of various elements of the Ottoman army. Chapter 42 deals with the akinji. Mihailović states that the akinji were organized in units of tens, hundreds or thousands, and led by provincial leaders called sanjak-begs. In enemy territory they would split into numerous small units that avoided enemy military troops, and captured civilians. All captives were brought to a prearranged meeting place that had remounts, and was guarded by the sanjak-beg and his retinue. When the desired amount of captives was caught, they were transported back across the military border with the sanjak-beg and his retinue acting as a rearguard during the retreat. If pursued, they would fight if they thought they could win the engagement. If the enemy forces were too strong, they would kill their captives, scatter and flee (Mihailović, 1986).

Comparing this information with the osteological data from Čepin suggests that the purpose of the 1441 akinji raid was *not* the accumulation of captives. This assertion is based on the following arguments.

The demographic profile of the victims suggests that young adults were specifically targeted in the attack. In both the total adult sample, and the female subsample, the presence of perimortem trauma is significantly asso-

ciated with younger age categories. The same trend is present in the male subsample, although in this case the association is not significant.

The capture and sale of slaves usually brought a sizeable income to the individual akinji. As previously noted, slavery was an institution of vital significance for Ottoman society. The Ottoman army, state, economy, and all upper class families depended upon slaves that were supplied from outside the Ottoman Empire. The value of a slave depended on numerous factors. Chief among them were the demand for slaves—which remained uniformly high from the 14th to 16th centuries, and the qualifications of the individual captive. The more exceptional these were, the higher was his value. It is, of course, impossible to speculate on the qualifications of the inhabitants of Čepin, but a general trend that appears to have been present in most slave-owning societies is that the highest prices were achieved by young adults. This is precisely the demographic profile of the victims in Čepin. It seems unreasonable that the victims of a raid, whose objective was the accumulation of captives, would be the potentially most valuable slaves. There is, of course, the possibility that individuals with perimortem trauma in Čepin resisted capture, and were therefore killed either as punishment or as a warning to others, but the demographic profile of the victims, almost half of whom are women and children makes this unlikely.

An additional argument against the hypothesis that the objective of the 1441 raid was the accumulation of captives concerns the number, distribution and pattern of perimortem injuries in Čepin.

As is clear from Mihailović's account, if cornered by a superior enemy the akinji were not averse to slaughtering their captives. The distribution of perimortem injuries in Čepin is not, however, compatible with the quick elimination of helpless captives. Instead, analysis of the perimortem injuries inflicted on the inhabitants of Čepin suggests two different scenarios: one for males, and one for females.

The distribution of perimortem injuries in the male subsample is broadly similar to the distribution of perimortem injuries recorded in other European medieval and historic period battle sites such as: Aljubarrota in Portugal (Cunha and Silva, 1997), Visby and Uppsala in Sweden (Ingelmark, 1939; Kjellström, 2005), Sandbjerget in Denmark (Bennike, 1998), and Towton in England (Novak, 2000). As in most of these sites, the highest number of wounds is recorded on the cranium: 4/10 males with preserved crania in Čepin exhibit at least one perimortem injury in this part of the skeleton, and cranial wounds account for 36.0% (9/25) of all perimortem injuries. Uppsala, Towton and Sandbjerget exhibit an even more uneven distribution between injuries recorded on the cranium and postcranium. In Uppsala 60% of the recovered crania exhibit at least one perimortem injury, and cranial wounds account for 89.3% (92/103) of all perimortem injuries (Kjellström, 2005). In Towton 96% of the crania exhibit battle related injuries, and cranial wounds account for 72.4% (113/156) of all perimortem injuries (Novak, 2000), while in Sandbjerget 90% of the skulls exhibit perimortem injuries, and cranial wounds account for 66.0% (122/185) of all perimortem injuries (Bennike, 1998). The only battle site in which cranial wounds account for less than 50% of all perimortem injuries is Visby, where injuries to the skull account for 40% (182/456) of all perimortem trauma (Ingelmark, 1939).

The uneven distribution of injuries between the crania and the rest of the remains is clearly not accidental, and shows that the head of the opponent was the primary target during fighting between European medieval and historic period combatants. The, in comparison, relatively low frequency of cranial injuries in Čepin males can be explained in two ways. One possibility is that the akinji raiders employed close combat fighting techniques that were different from those practiced by the European cultures that fought in the battles of Uppsala, Towton, Sandbjerget, and Visby. A possibly more likely explanation is that the confrontation in Čepin was not a face-to-face fight between similarly armed or proficient opponents.

The location of postcranial injuries offers additional information on the fighting situation. Similar to individuals recovered from Towton and Sandbjerget, Čepin males exhibit a high frequency of injuries to the forearms and hands. In Towton 26/43 or 60.5% of all postcranial wounds were recorded on the forearms (Novak, 2000), while in Sandbjerget the ratio was 21/63 or 33%, (Bennike, 1998). In Čepin males 5/16 or 31.2% of all postcranial injuries were recorded in this part of the skeleton. These wounds are typically interpreted as defensive injuries, and suggest that the attacked men were attempting to protect themselves in a close combat situation. The low frequencies of these injuries in Uppsala and Visby are accompanied with high frequencies of perimortem injuries to the tibiae, and are interpreted as wounds inflicted on mounted men with exposed shins (Ingelmark, 1939; Kjellström, 2005).

An additional feature often evaluated in bioarchaeological studies is the prevalence of left-sided injuries to the frontoparietal region of the cranium in a sample. These injuries are interpreted as the result of single face-to-face fighting with a right handed opponent (Ingelmark, 1939; Manchester, 1983). In Visby 69% of the cranial blade wounds were located on the left side (Ingelmark, 1939). Similarly, the left side of the skull exhibited more lateral wounds than the right in Towton (Novak, 2000). No clear side dominance was noted in Sandbjerget or Uppsala (Bennike, 1998; Kjellström, 2005) suggesting that many of the men who died in these battles were not killed while fighting face-to-face. The same applies to Čepin males where only one perimortem injury to the left side of the frontoparietal region of the skull was noted. Instead, the majority (7/9) of the cranial wounds recorded in males were located in the posterior region of the skull, predominantly on the right side (5/7). At the level of the complete skeleton, more than half (13/25) of the perimortem injuries recorded in males were located on the posterior side: seven on the right side, five on the left, and one parasagittaly. Posterior wounds also may have been more lethal than those inflicted from in front. Five of the seven wounds that penetrated, or sliced off bony elements in the male subsample were located on the posterior side.

Cumulatively, these data suggest that at some point during the fighting, most males from Čepin attempted to run away, and were then cut down from behind by the akinji raiders.

Although this scenario cannot be considered, by any stretch of the imagination, as anything other than bad, the scenario that the pattern of perimortem trauma in females suggests is worse.

The distribution, and pattern of perimortem trauma in females differs from the one recorded in males in several

important features. In contrast to the pattern noted in males, the majority of injuries in females (37/52 or 71.1%) are located on the anterior side of the skeleton. Females also exhibit a higher frequency of injuries to the left frontoparietal region of the cranium than males. As previously noted, high frequencies of these injuries are typically interpreted as a result of face-to-face fighting. This, unfortunately, is not congruent with the morphology, distribution, number of, and pattern of perimortem injuries in female skeletons. All of these suggest an element of gratuitous or excessive violence aimed at Čepin females.

At the level of the total number of perimortem trauma this is seen in the fact that females exhibit significantly more perimortem injuries both per individual, and per bone affected than males.

At the level of the pattern of perimortem injuries in the whole female skeleton this is seen in the combination of a very high frequency of cranial injuries—28/52 or 53.9%, a frequency similar to the one recorded in Sandbjerget, and higher than the frequency recorded in Visby, combined with a very low frequency of injuries to the upper extremities—2/52 or 3.8%. This frequency is significantly lower than the frequency recorded in males—5/25 or 20.0%, and suggests that the women were either bound, or deceased when the cranial injuries were inflicted.

The morphology and distribution of cranial wounds in females is also suggestive of gratuitous violence. As previously noted, none of the 28 cranial wounds recorded in females penetrated the cranial vault. This differs not only from the pattern noted in the male subsample from Čepin—where 3/9 cuts penetrated or sheared of bony elements, but also with the pattern noted in the other Balkan series where all nine individuals with perimortem trauma exhibited penetrating cranial perimortem injuries (Živanović, 1985; Šlaus, 2008). Obviously, any individual short, shallow, nonpenetrating injury from a bladed weapon to the cranium can result from either the victim moving while trying to escape, or the attacker missing with his blow. However, the total pattern of cranial perimortem injuries in Čepin females—where four individuals exhibit not one, but between four to nine such injuries, arraigned in more or less parallel rows, that either circumscribe the cranial vault or are concentrated in a small area of the skull—suggests that this scenario is unlikely. Further, specific, injuries suggestive of torture or mutilation include four cuts to the superior left orbits of two individuals, one to the left nasal bone, and one to the left mastoideus.

In the postcranial skeleton the presence of 22 perimortem injuries in the general pelvic area of 15- to 29-year old female is clear evidence of "overkill." The fact that at least three types of weapon were used on this individual is also consistent with the hypothesis that gratuitous or excessive violence was inflicted on Čepin females.

Altogether, the osteological data from Čepin are consistent with historical reports describing the extremely violent and sadistic behavior of the akinji when the primary objective of their raid was spreading terror and panic. Two factors may have contributed to the Turkish decision to terrorize the greater Osijek area.

The first is that during 1441 the Ottoman Turks suffered several important military reverses in Serbia and Bulgaria (Inalcik, 2002). The raid could have, therefore, been retaliatory, as revenge for the recent military setbacks.

An alternative reason for the attack on Čepin is more strategic in nature. As is evident from Figure 1 Čepin is located just 11 Km southwest of the town of Osijek. Osijek is one of the few places where the formidable Drava river can be crossed. The closest other location in Historic times was modern Ptuj in Slovenia, ~240 km to the northwest. For the Turks, control of Osijek meant control over the only crossing over the Drava river realistically available to them and, as is evident from Figure 1, all attempts to penetrate the Pannonian plain that leads to the large cities of Budapest and Vienna were depended on their crossing the Drava. The akinji raid of 1441 may, therefore, have been undertaken for the purpose of spreading panic, and depopulating the area around Osijek with the aim of facilitating its later conquest by regular Turkish forces.

In conclusion, bioarchaeological analyses provide us with the opportunity to reconstruct and interpret past events, not from the viewpoint of the victors—whose record of the event is usually the one that is passed on through history, but through the experiences of the defeated. The osteological and archaeological data gathered in Čepin strongly suggest that individuals with perimortem trauma were victims of the historically documented 1441 akinji raid, and that the objective of this raid was to spread terror and panic in the general Osijek area, either as revenge for recent military setbacks, or as part of a long-term strategy intended to depopulate the area around Osijek in order to facilitate its later conquest by regular Turkish troops. Despite the heavy loss of life that probably affected most families in this small community, and the no doubt immense psychological stress that incorporated itself into the collective memory of the survivors to the point that, even today the site is known as "Čepin—Turkish cemetery," the attack did not lead to the abandoning of the village. Čepin continued to be inhabited at least until the beginning of the 16th century attesting thus, not only to the harsh and brutal living conditions on the historic period military border between Croatia and the Ottoman Turkish Empire, but also to the resilience of its past inhabitants.

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LITERATURE CITED

Adamček J. 1980. Agrarni odnosi u Hrvatskoj od sredine XV do kraja XVII stoljeća. Zagreb: Sveučilišna naklada Liber.

Bass WM. 1987. Human osteology. A laboratory and field manual of the human skeleton. Columbia, MO: Missouri Archaeological Society.

Bennike P. 1998. De faldne fra Krigergraven-analys af skeletterne fra Sandbjerget. Liv og Levn 12:14–21.

Berryman HE, Symes SA. 1998. Recognizing gunshot and blunt cranial trauma through fracture interpretation. In: Reichs KJ, editor. Forensic osteology: advances in the identification of human remains. Springfield, IL: Charles C. Thomas. p 333–352.

Boylston A. 2000. Evidence for weapon-related trauma in British archaeological samples. In: Cox M, Mays S, editors. Human osteology in archaeology and forensic science. London: Greenwich Medical Media. p 357–380.

Brooks S, Suchey JM. 1990. Skeletal age determination based on the os pubis: a comparison of the Acsádi-Nemeskéri and Suchey-Brooks methods. Hum Evol 5:227–238.

Cunha E, Silva AM. 1997. War lesions from the famous Portugese medieval battle of Aljubarrota. Int J Osteoarchaeol 7:595–599.

Galloway A, Symes SA, Haglund WD, France DL. 1999. The role of forensic anthropology in trauma analysis. In: Galloway A,editor. Broken bones: anthropological analysis of blunt force trauma. Springfield, IL: Charles C. Thomas. p 5–31.

Goodwin G. 2006. The Janissaries. London: Saqi Books.

Haglund WD. 1997. Dogs and coyotes: postmortem involvement with human remains. In: Haglund WD, Sorg MH, editors. Forensic taphonomy. The postmortem fate of human remains. Boca Raton, FL: CRC Press. p 367–381.

Haynes G. 1980. Prey bones and predators: potential ecological information from analysis of bone sites. Ossa 7:75–97.

Houck MH. 1998. Skeletal trauma and the individualization of knife marks in bone. In: Reichs KJ, editor. Forensic osteology: advances in the identification of human remains. Springfield, IL: Charles C. Thomas. p 410–424.

Inalcik H. 2002. Osmansko carstvo: klasično doba 1300–1600. Zagreb: Srednja Europa.

Ingelmark BE. 1939. The skeletons. In: Thordeman B, editor. Armour from the battle of Visby 1361. Stockholm: Kungliga Vitterhets historie och antikvitets akademien. p 149–209.

Işcan MY, Loth SR, Wright RK. 1984. Age estimation from the rib by phase analysis: white males. J Forensic Sci 29:1094–1104.

Işcan MY, Loth SR, Wright RK. 1985. Age estimation from the rib by phase analysis: white females. J Forensic Sci 30:853–863.

Kjellström A. 2005. A sixteenth-century warrior grave from Uppsala, Sweeden: the battle of Good Friday. Int J Osteoarchaeol 15:23–50.

Krogman WM, Işcan MY. 1986. The human skeleton in forensic medicine, 2nd ed. Springfield IL: C.C. Thomas.

Kruhek M. 1995. Krajiške utvrde i obrana hrvatskog kraljestva tijekom 16. stoljeća. Zagreb: Institut za suvremenu povijest.

Lambert PM. 1997. Patterns of violence in prehistoric hunter-gatherer societies of coastal southern California. In: Martin DL, Frayer DW, editors. Troubled times: violence and warfare in the past. Amsterdam: Gordon and Breach. p 77–109.

Lovejoy CO, Meindl RS, Pryzbeck TR, Mensforth RP. 1985. Chronological metamorphosis of the auricular surface of the ilium: a new method for the determination of age at death. Am J Phys Anthropol 68:15–28.

Lyman RL. 1996. Vertebrate taphonomy. Cambridge, United Kingdom: Cambridge University Press.

Manchester K. 1983. The archaeology of disease. Bradford: University of Bradford.

Mažuran I. 1991. Turske provale i osvajanja u Slavoniji od kraja 14. do sredine 16. stoljeća. In: Čalić D, Berber Đ, editors. Peti znanstveni sabor Slavonije i Baranje: Zbornik radova. Osijek: Jugoslavenska akademija znanosti i umjetnosti, Zavod za znanstveni rad u Osijeku. p 17–66.

Mažuran I. 1994. Srednjovjekovni i turski Osijek. Osijek: Zavod za znanstveni rad Hrvatske akademije znanosti i umjetnosti u Osijeku.

McKern TW, Stewart TD. 1957. Skeletal age changes in young American males. Analyzed from the standpoint of age identification. Environmental protection research division (Quartermaster research and development center, U.S. Army, Natick, Massachusetts), Technical report EP-45.

Meindl RS, Lovejoy CO. 1985. Ectocranial suture closure: a revised method for the determination of skeletal age at death based on the lateral-anterior sutures. Am J Phys Anthropol 68:57–66.

Merbs CF. 1989. Trauma. In: Işcan MY, Kennedy KAR, editors. Reconstruction of life from the skeleton. New York: Alan R. Liss. p 161–189.

Mihailović K. 1986. Janičarove uspomene ili Turska hronika. Beograd: Prosveta.

Mijatović A. 2005. Bitka na Krbavskom polju 1493. godine. Zagreb: Školska knjiga.

Mikić Ž. 1983. Antropološki prikaz srednjovjekovnih stanovnika Ričica. In: Jeličić J, editor. Ričice nekropole stećaka. Split: Regionalni zavod za zaštitu spomenika kulture—Split. p 45–59.

Milner GR, Anderson E, Smith VG. 1991. Warfare in late prehistoric west-central Illinois. Am Antiq 56:581–603.

Moorrees CFA, Fanning EA, Hunt EE. 1963. Age variation of formation stages for ten permanent teeth. J Dent Res 42:1490–1502.

Novak M, Šlaus M, Pasarić M. 2007. Bioarchaeological characteristics of the Early modern population from the Koprivno kod križa site near Klis. Opuscula Archaeol 31:303–346.

Novak S. 2000. Battle related trauma. In: Fiorato V, Boylston A, Knusel C, editors. Blood red rose: the archaeology of a mass grave from the Battle of Towton AD 1461. Oxford: Oxbow. p 90–102.

Olesnicki AA. 1938. Bošnjak Hadum Jakub, pobjednik na Krbavskom polju g. 1493. Rad JAZU 264:123–160.

Pilarić G. 1969. Antropološka istraživanja slavenske populacije sa Baltinih bara kod Gomjenice. Glasnik Zemaljskog muzeja Bosne i Hercegovine u Sarajevu 24:185–211.

Porter S, Woodworth M, Earle J, Drugge J, Boer D. 2003. Characteristics of sexual homicides committed by psychopathic and nonpsychopathic offenders. Law Hum Behav 27:459–470.

Reichs KJ. 1998. Postmortem dismemberment: recovery, analysis and interpretation. In: Reichs KJ, editor. Forensic osteology: advances in the identification of human remains. Springfield, IL: Charles C. Thomas. p 353–388.

Sauer NJ. 1998. The timing of injuries and manner of death: distinguishing among antemortem, perimortem and postmortem trauma. In: Reichs KJ, editor. Forensic osteology: advances in the identification of human remains. Springfield, IL: Charles C. Thomas. p 321–332.

Scheuer L, Black S. 2000. Developmental juvenile osteology. San Diego: Academic Press.

Šimić J. 1997. Čepin-Ovčara Tursko groblje. Istraživanje srednjovjekovne utvrde i groblja ranog srednjeg vijeka pokraj Čepina, nedaleko od Osijeka. Obavijesti HAD-a 29:89–91.

Šimić J. 2002. Istraživanje prapovijesnog i srednjovjekovnog lokaliteta Čepin-Ovčara/Tursko groblje u godini 2001. Obavijesti HAD-a 34:46–50.

Šimić J. 2004. Istraživanje u Čepinu-Ovčara/Tursko groblje u godini 2002 i 2003. Obavijesti HAD-a 36:55–61.

Šimić J. 2007. Čepin-Ovčara/Tursko groblje, istraživanje godine 2006. Obavijesti HAD-a 39:65–72.

Šlaus M. 1997. Discriminant function sexing of fragmentary and complete femora from medieval sites in continental Croatia. Opuscula Archaeol 21:167–175.

Šlaus M. 2000. Biocultural analysis of sex differences in mortality profiles and stress levels in the Late medieval population from Nova Rača, Croatia. Am J Phys Anthropol 111:193–209.

Šlaus M. 2008. Osteological and dental markers of health in the transition from the Late antique to the Early medieval period in Croatia. Am J Phys Anthropol 136:455–469.

Šlaus M, Kollmann D, Novak SA, Novak M. 2002. Temporal trends in demographic profiles and stress levels in Medieval (6th-13th century) population samples from continental Croatia. Croatian Med J 43:598–605.

Šlaus M, Novak M, Bedić Ž, Vyroubal V. 2007. Antropološka analiza kasnosrednjovjekovnog groblja kraj crkve Sv. Franje na Opatovini u Zagrebu. Arheološki radovi i rasprave 15:211–247.

Šlaus M, Tomičić Ž. 2005. Discriminant function sexing of fragmentary and complete tibiae from medieval Croatian sites. Forensic Sci Int 147:147–152.

Spitz WU. 1980. Blunt force injury. In: Spitz WU, Fisher RS, editors. Medicolegal investigation of death: guidelines for the application of pathology to crime investigation. Springfield, IL: Charles C. Thomas. p 230–251.
Steadman DW. 2008. Warfare related trauma at Orendorf, a Middle Mississippian site in west-central Illinois. Am J Phys Anthropol 136:51–64.
Stern P. 1529. Belegerung der Statt Wienn im jar als zallt nach Cristi geburt 1529: kürtzlich angezaigt. Wien: Hieron Vietor.
Symes SA, Berryman HE, Smith OC. 1998. Saw marks in bone: introduction and examination of residual kerf contour. In: Reichs KJ, editor. Forensic osteology: advances in the identification of human remains. Springfield, IL: Charles C. Thomas. p 389–409.
Vlak D. 2006. Bioarheološka analiza osteološkog materijala sa srednjovjekovnog lokaliteta crkva Svetog Pantelejmona u Nišu. MSc Thesis, University of Zagreb, Zagreb.
Živanović S. 1985. Tragovi povreda, poremećaja i oboljenja na ostacima skeleta ljudi iz nekropole crkve broj 1 u Trgovištu. Novopazarski zbornik 9:201–214.
Živanović S. 1986. Ostaci skeleta sa nekropole pored crkve u Deževu. Starinar 36:151–160.
Živanović S. 1987. Skeleti nekropole crkve 4 na lokalitetu Tabačina u Trgovištu. Novopazarski zbornik 11:73–91.