ANTHROPOLOGICAL ANALYSIS
OF DENTAL REMAINS
OF TWO MEDIEVAL SERBIAN POPULATIONS


Abstract. Teeth are of considerable value in estimating the age of individuals at burial, in determining the number of individuals present in an excavation; they could indicate evolutionary trends, racial affinities, genetic differences and diet variations. In order to determine characteristics of the teeth of the Medieval Serbs we have carried out the investigation of the number, size and shape of teeth in skeletal remains from two Medieval necropolises. The research was not limited to morphology, odontometry and to the comparison to the findings in different necropolises, but we also investigated variations in the rates and patterns of dental wear.

Key words: medieval population, teeth morphology, dental wear, missing teeth

Introduction

The study of the teeth number, size and shape in skeletal populations is of great importance in anthropological investigations with reference to the fact that teeth, being made of tissue particularly resistant to decay, are common finds in archaeological sites. Dental size and morphology are an easily recorded aspect of phenotypic
variations. This is a result of a complex relationship between genetics and the environment. According to Garn et al. (1965) most of variations in teeth size are genetically determined, and thus differences between populations represent genetical divergence rather than differences in environmental conditions. Congenital variations in the number of teeth among different populations may also suggest their genetic differentiation.

The rate of dental wear depends on many factors, such as morphology of the crown, structure of the dentine and cement, chewing mechanism, nature of the diet and the use of teeth as tools. Variation in wear rates and patterns within population and among different populations might be used for age determination and for the reconstruction of the diet.

**Material and methods**

Investigated material consisted of 230 skeletons excavated from two Medieval Serbian cemeteries: one located near the monastery church of Žiča and the other one near the church of St. Resurrection at Cačak. The study of teeth number, size and morphology has been limited as regards the number of investigated teeth due to considerable fragmentariness of material in both necropolises. Thus, each characteristic was observed on a different number of teeth.

<table>
<thead>
<tr>
<th>Variation</th>
<th>Žiča</th>
<th></th>
<th></th>
<th>Cacak</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>n</td>
<td>%</td>
<td>N</td>
<td>n</td>
<td>%</td>
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<tr>
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<td></td>
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<tr>
<td>upper M3</td>
<td>47</td>
<td>2</td>
<td>4.3</td>
<td>28</td>
<td>6</td>
<td>21.4</td>
</tr>
<tr>
<td>lower M3</td>
<td>53</td>
<td>3</td>
<td>5.7</td>
<td>47</td>
<td>8</td>
<td>17</td>
</tr>
<tr>
<td>upper 12</td>
<td>47</td>
<td>1</td>
<td>2.1</td>
<td>28</td>
<td>1</td>
<td>3.6</td>
</tr>
<tr>
<td>upper P</td>
<td>47</td>
<td>1</td>
<td>2.1</td>
<td>28</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>lower P</td>
<td>53</td>
<td>1</td>
<td>1.9</td>
<td>47</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Extra</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>upper 12</td>
<td>47</td>
<td>1</td>
<td>2.1</td>
<td>28</td>
<td>0</td>
<td>0</td>
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<td>Shovel-shaped incisors</td>
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<td>2</td>
<td>8.7</td>
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<td>0</td>
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<tr>
<td>Reduced upper lateral incisor</td>
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<td>0</td>
<td>0</td>
<td>9</td>
<td>1</td>
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<td>Three-cusped</td>
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<td></td>
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<tr>
<td>upper M2</td>
<td>23</td>
<td>5</td>
<td>21.7</td>
<td>21.7</td>
<td>3</td>
<td>23.1</td>
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<tr>
<td>lower M2</td>
<td>33</td>
<td>1</td>
<td>3.3</td>
<td>21</td>
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<td>0</td>
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<tr>
<td>upper M3</td>
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<td>4</td>
<td>3.0</td>
<td>12</td>
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<tr>
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<td>0</td>
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<td>17</td>
<td>5</td>
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<td>Carabelli trait</td>
<td>upper M1</td>
<td>34.8</td>
<td>53.8</td>
<td></td>
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</tbody>
</table>

N = number of investigated teeth; n = number of observed characteristics
According to the patterns of dental wear we have distinguished three types of damage: horizontal (occlusal), vertical and mixed, horizontal-vertical type. According to the degree of wear we have classified all cases into four categories: I – slight wear, only enamel involved; II – dentine exposed and the whole occlusal surface consists of a shallow area of dentine surrounded by rim of enamel; III – pulp chamber is penetrated; IV – loss of the crown.

Results and discussion

Missing teeth – Missing of the teeth can be caused by agenesis or incomplete eruption. The third molar is the most commonly absent permanent tooth. Review of a number of studies (over 11,000 individuals) made by Brothwell (1963) showed a wide range of individuals lacking one or more third molars: from 0.2 to 36.6% in recent populations and from 1.9 to 20.5% in archaeological material. Examining our material we found the deficiency of upper third molar in 4.26% in Žića and 21.4% in Cacak, and the deficiency of lower molar in 5.7% in Žića and 16.7% in Cacak. In the study of Medieval archaeological materials from different cities in former Yugoslavia (Mucic 1990) missing of the third molar was found in 20.9% and in recent populations (Markovic 1976) in 10 to 35% of the material.

Congenital absence of the upper lateral incisors we have found in one case in Žića and in one case in Cacak (Fig. 1), and the absence of the second premolars in two cases in Žića. Absence of incisors has been found to be more common in the Mongoloid populations than among Europeans (Pedersen 1949; Tratman 1950).

Table 2

<table>
<thead>
<tr>
<th>Average gradient of molar wear</th>
<th>Žića</th>
<th>Cacak</th>
</tr>
</thead>
<tbody>
<tr>
<td>I category</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>II category</td>
<td>6</td>
<td>13.1</td>
</tr>
<tr>
<td>III category</td>
<td>8</td>
<td>17.4</td>
</tr>
<tr>
<td>IV category</td>
<td>13</td>
<td>28.3</td>
</tr>
<tr>
<td>Total</td>
<td>46</td>
<td>100</td>
</tr>
</tbody>
</table>

N = number of examined individuals

Extra teeth – The presence of more teeth than usual is more rare than missing teeth. Pedersen (1949) reviewed findings of various authors and found an overall range of 0.12 to 2.7%. There was no one case found in a study of the Medieval skeletons from necropolises in former Yugoslavia (Mucic 1990) and in recent population extra teeth were found in 0.4% of cases (Markovic 1976). In our material
Fig. 1. Absence of the upper lateral incisors

Fig. 2. Retention of the milk upper lateral incisor
Fig. 3. Reduced upper lateral incisor

Fig. 4. Advanced mixed type of abrasion followed by the lowering of the occlusal surface
we found one case of the increased number of teeth caused by the retention of the
milk upper lateral incisors (Fig. 2).

On the basis of the odontometric analysis we found that most of the investigated
individuals belonged to the group of microdonti (according to the crown module of
upper molars), and to the group of mesodonti (according to the crown index of
lower molars). Relationships between mesiodistal and bucolingual diameters of mo-
lars showed a M1M2M3 pattern, commonly found in all recent populations.

Considering the size and shape of the teeth the studies of modern and past po-
pulations showed that lower central incisors, upper lateral incisors, second premolars,
and second and third molars were most variable teeth (Dahlberg 1945).

In our material shovel-shaped incisors have been observed in two cases in Žića.
This variant is found most often in the Mongoloid groups: 86–100% cases in the Ame-
rican Indians, 84–95% in the Eskimos, 91% in the Mongolians, 82–94% in the Chinese,
78% in the Japanese (Hrdlicka 1920; Lasker, Lee 1957; Dahlberg 1951; Carbonell

Reduced upper lateral incisor we have found in one case in Caćak (Fig. 3).

The study of the occlusal surface pattern showed marked variations in the num-
ber of cusps and groove patterns. In upper molars commonly occurred X4 form (in Žića
57.1% on M1, 52.2% on M2) and +4 form (in Caćak 66.7% on M1, 38.5%
on M2). In the first lower molars Y5 pattern occurred frequently (57.1% in Žića,
62.5% in Caćak); in the second molars: +4 form (87.9% in Žića, 95.2% in Caćak)
was frequent.

Hypocone reduction varies between populations and from tooth to tooth. The
percentage of three-cusped upper second molars we have found (21.7% in Žića;
23.1% in Caćak) was similar to the frequency appearing in other European popu-
lation samples (23.9%; Wajerman, Levy 1979). The three-cusped form was a com-
mon type of third molar (in Caćak – 41.7% on upper molars and 29.4% on lower
molars; in Žića – 33.3% on upper molars and 0% on lower molars).

Extra cusps (6-cusp forms) were present on third molars only.

The Carabelli trait, tubercle on the lingual base of the protocone, occurred in
53.8% cases in Caćak and in 34.8% cases in Žića. In our material, it has been found
only on the first upper molars. The frequency of appearance of Carabelli’s cusps
varies widely between populations (35–85%; Scott 1980). The highest frequencies
have been observed in the people of European origin (Hillson 1986).

The teeth wear showed a frequency rate of 100% and predominantly horizontal type
of abrasion (85% in Žića and 92% in Caćak). Vertical type of abrasion was not found.
The second category of abrasion with exposed dentine was most frequent in both po-
pulations – 42.3% in Žića, 25.6% in Caćak). Due to the fact that in both investigated
populations individuals died mostly at the age between 40 and 60 years and that only
5% of the population lived longer than 60 years (Djuric et al. 1992), such a high rate
of abrasion could be explained with an abrasive diet in the Medieval Serbia.
References


