About the importance of odontological documentation of ante-mortem details of two soldiers killed in World War II. A contribution of the German Academy of Forensic Odontostomatology.

De l'importance d'une documentation odontologique ante-mortem détaillée dans les forces armées

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Introduction

In the forest of Dillingen, Germany, the skeletons of two German soldiers were found. More than 1 million German soldiers killed in war time are still missed. The DEUTSCHE DIENSTSTELLE in Berlin is responsible to clear the situation of those missed German soldiers. The unique structures and traits of human teeth and jaws readily lend themselves to use in the identification of deceased victims. Dental data can be recovered and recorded at the time of postmortem examination and compared to antemortem data which are supplied by generalist and/or specialist dentists who treated the victim during her/his lifetime. The teeth are well protected in the oral cavity and are able to withstand many external influences near, at or after the time of death. Teeth comprise the hardest substances in the human body, so as the body's soft tissues decompose, the dental characteristics which are so valuable for identification purposes remain accessible.

This is especially true concerning age estimation for each individual. Anatomical and morphological findings can also be compared even in absence of any dental treatment. The conclusions available to the DVI odontologist to choose of, following his comparison of postmortem and antemortem dental records includes.

Material and Methods

In spring 2008 I received the skull and fragments of jaws to estimate the age of two German soldiers. I was informed that only the age of the two missed soldiers was known. I was not informed about their age. The teeth of soldier 1 were examined by the methods of BANG und RAMM and KVAAL. The teeth of soldier 2 were examined by the methods of HAAVIKKO, ANDERSON, HARRIS/NORTJE, KULLMANN and DEMIRJIAN.
Fig. 3: Post mortem X-ray, showing tooth 22, belonging to soldier 1, was examined by the Method of KVAAL.

Fig. 4: Post mortem X-ray, showing tooth 44, belonging to soldier 1, was examined by the Method of KVAAL.

Fig. 5: Post mortem X-ray, showing tooth 48, belonging to soldier 1. The roots are completely developed.

Fig. 6: Post mortem X-ray, showing tooth 38, belonging to soldier 1. The roots are completely developed.

Fig. 7: Tooth 21 length cut. Comparison measurement WHO periodontal probe.

Fig. 8: Soldier 2, tooth 38.
Results

I commit the estimated age of soldier 1 of 30-35 years.

<table>
<thead>
<tr>
<th>method</th>
<th>tooth</th>
<th>estimated living age</th>
<th>standard-deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>KVAAL</td>
<td>22</td>
<td>27.9 years</td>
<td>+/- 5 years</td>
</tr>
<tr>
<td>KVAAL</td>
<td>44</td>
<td>30.3 years</td>
<td>+/- 5 years</td>
</tr>
<tr>
<td>BANG/RAMM</td>
<td>21</td>
<td>41 years</td>
<td>+/- 4.8 years</td>
</tr>
<tr>
<td>average</td>
<td></td>
<td>29.5 years</td>
<td>+/- 4.9 years</td>
</tr>
</tbody>
</table>

Table 1: Age estimation of soldier 1.

I commit the estimated age of soldier 2 of 17 ±2 years.

<table>
<thead>
<tr>
<th>tooth</th>
<th>HAAVIKKO</th>
<th>ANDERSON</th>
<th>HARRIS/NORTJÈ KULLMANN</th>
<th>DEMIRJIAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>R 3/4</td>
<td>R 3/4</td>
<td>R 2/3</td>
<td>Stadium F</td>
</tr>
<tr>
<td></td>
<td>17 +/- 2.8 ys</td>
<td>17 +/- 2.8 ys</td>
<td>17.8 +/- 1.4 ys</td>
<td>18.3 +/- 2.2 yrs</td>
</tr>
<tr>
<td>28</td>
<td>R 3/4</td>
<td>R 3/4</td>
<td>R 1/2</td>
<td>Stadium F</td>
</tr>
<tr>
<td></td>
<td>17 +/- 2.8 ys</td>
<td>17 +/- 2.8 ys</td>
<td>16.1 +/- 1.73 yrs</td>
<td>18.3 +/- 2.2 yrs</td>
</tr>
<tr>
<td>38</td>
<td>R 1/2</td>
<td>R 2/3</td>
<td>R 2/3</td>
<td>Stadium E</td>
</tr>
<tr>
<td></td>
<td>16.7 +/- 3.7 yrs</td>
<td>17.8 +/- 1.4 yrs</td>
<td>17.8 +/- 1.4 yrs</td>
<td>16.7 +/- 2.3 yrs</td>
</tr>
<tr>
<td>48</td>
<td>R 1/2</td>
<td>R 1/2</td>
<td>R 2/3</td>
<td>Stadium E</td>
</tr>
<tr>
<td></td>
<td>16.7 +/- 3.7 yrs</td>
<td>16.1 +/- 1.73 yrs</td>
<td>17.8 +/- 1.4 yrs</td>
<td>16.7 +/- 2.3 yrs</td>
</tr>
</tbody>
</table>
Table 2: Age estimation of soldier 2.

Conclusions

The method of KVAAL needs a measurement of the width of each tooth in the region of the margin of enamel-dentin in relation to the width of the root canal in the same extension. The shown teeth had defects in the region of the margin of enamel-dentin, so the measurement was difficult and partial impossible. The relation width of root canal/width was supposed to be overestimated and the age estimate therefore underestimated. Handmade length cuts, to measure the apical translucency, being not exactly in the saggittal axis of a tooth may lead to an overestimation of age. I commit the estimated age of soldier 1 of 30-35 years. I commit the estimated age of soldier 2 of 17 ±2 years.

Later on, I was informed about the age of the 2 missed soldiers. Soldier 1 should be 32 years old, Soldier 2 should be 20 years old. The case shows again the significant importance of detailed recorded ante-mortem findings of all persons serving in hazardous environments as soldiers or also disaster management personnel do.

Literature


Abbreviations

DVI Disaster Victim Identification

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