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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

Language: English

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Poster Award

Introduction

In the forest of Dillingen, Germany, the skeletons of two German soldiers were found. More then 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.

Fig. 1: The place were the dead soldiers were found.

Fig. 2: Lower jaw of soldier 1.

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/NORTJÈ, KULLMANN and DEMIRJIAN.

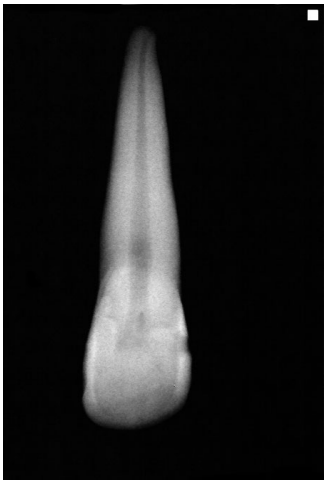

Fig. 3: Post mortem X-ray, showing tooth 22, belonging to soldier 1, was examined by the Method of KVAAL.

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.

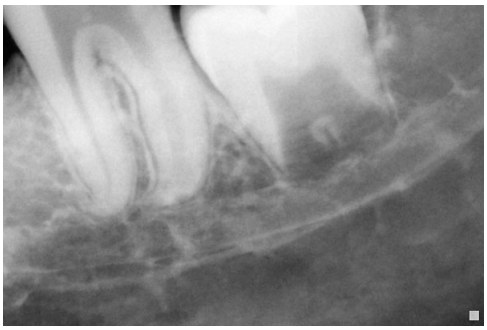

Fig. 9: Soldier 2, tooth 38, root not completely developed.

Fig. 10: Soldier 2, tooth 48.

Fig. 11: Soldier 2, tooth 48, root not completely developed.

Fig. 12: Soldier 2, tooth 18, root not completely developed.

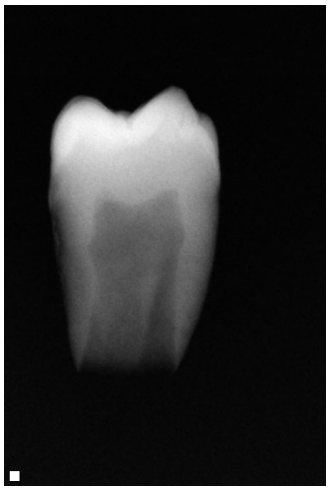

Fig. 13: Soldier 2, tooth 28, root not completely developed.

Results

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

method	tooth	estimated living age	standard-deviation
KVAAL	22	27.9 years	+/− 5 years
KVAAL	44	30.3 years	+/− 5 years
BANG/RAMM	21	41 years	+/− 4.8 years
average		29.5 years	+/− 4.9 years

Table 1: Age estimation of soldier 1.

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

tooth	HAAVIKKO	ANDERSON	HARRIS/NORTJÈ	KULLMANN	DEMIRJIAN
18	R 3/4 17 +/− 2.8 ys	R 3/4 17 +/− 2.8 ys			Stadium F 18.3 +/− 2.2 ys
28	R 3/4 17 +/− 2.8 ys	R 3/4 17 +/− 2.8 ys			Stadium F 18.3 +/− 2.2 ys
38	R 1/2 16.7 +/− 3.7 ys	R 2/3 17.8 +/− 1.4 ys	R 2/3 17.8 +/− 1.4 ys	R 1/2 16.9 +/− 1.1 ys	Stadium E 16.7 +/− 2.3 ys
48	R 1/2 16.7 +/− 3.7 ys	R 1/2 16.1 +/− 1.73 ys	R 2/3 17.8 +/− 1.4 ys	R 1/2 16.9 +/− 1.1 ys	Stadium E 16.7 +/− 2.3 ys

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

1. Anderson DL, Thompson GW, Popovich F (1976) Age of Attainment of Mineralization Stages of the Permanent Dentition. J Forensic Sci, 21, No. 1, 191-200.
2. Bang G, Ramm E (1970) Determination of age in humans from root dentin transparency. Acta Odontol Scand; 28:3-35.
3. Demirjian A, Goldstein H, Tanner JM (1973) A New System of Dental Age Assessment. Human Biology, Vol 45, No. 2: 211-227.
4. Harris MJP, Nortjé CJ (1984) The Mesial Root of the Third Mandibular Molar - A Possible Indicator of Age. J Forensic Odonto-Stomatology, 2, 39-43.
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Abbreviations

DVI Disaster Victim Identification

This Poster was submitted by Dr. Hans-Peter Kirsch.

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XVIII ème Congrès A.F.I.O. - NANTES, France - 25.-26. Septembre 2008
The Annual A.F.I.O. Meeting on Forensic Odontology
De l'importance d'une documentation odontologique ante-mortem détaillée dans les forces armées
ABOUT THE IMPORTANCE OF ODONTOLOGICAL DOCUMENTATION OF ANTE-MORTEM DETAILS OF TWO SOLDIERS KILLED IN WORLD WAR II

German Society of Dental, Oral and Craniomandibular Sciences and German Society of Legal Medicine
GERMAN ACADEMY OF FORENSIC ODONTOSTOMATOLOGY

Fig 1 The place were the dead soldiers were found.

Fig 2 Lower jaw of soldier 1.

Fig 3 and 4 Two post mortem X-rays, showing tooth 22 and 44, belonging to soldier 1, were examined by the Method of KVAAL.

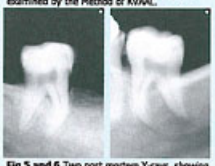

Fig 5 and 6 Two post mortem X-rays, showing tooth 48 and 38, belonging to soldier 1. Their roots are completely developed.

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Fig 11 soldier 2, tooth 48.

Fig 12 soldier 2, tooth 48, root not completely developed

Fig 13 soldier 2, tooth 18, root not completely developed

Fig 14 soldier 2, tooth 28, root not completely developed

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Abstract
The identification of skeletons by dental means is based on the maceration of the jaws, photography, X-rays, X-ray examination and comparison with AM documents. The case of two German soldiers, killed in World War II and found after more than 60 years, shows the importance of recording odontological details of the armed forces servicemen. Age estimation by different methods, e.g. by the methods of KVAAL and BANG/RAMM, not always lead to accurate results.

Keywords
Forensic Odontology, Age Estimation, Documentation, Identification.

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Tab 2 Age estimation of soldier 2.

tooth	HAAVIKKO	ANDERSON	HARRIS/NORTJÉ	KULLMANN	DEMIRJIAN
18	R ¾ 17 +/- 2,8 years	R ¾ 17 +/- 2,8 years			Stadium F 18,3 +/- 2,2 years
28	R ¾ 17 +/- 2,8 years	R ¾ 17 +/- 2,8 years			Stadium F 18,3 +/- 2,2 years
38	R ½ 16,7 +/- 3,7 years	R 2/3 17,8 +/- 1,4 years	R 2/3 17,8 +/- 1,4 years	R1/2 16,9 +/- 1,1 years	Stadium E 16,7 +/- 2,3 years
48	R ½ 16,7 +/- 3,7 years	R ½ 16,1 +/- 1,73 years	R 2/3 17,8 +/- 1,4 years	R1/2 16,9 +/- 1,1 years	Stadium E 16,7 +/- 2,3 years

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