

The Significance of Dental Findings on Personal Identification

Masanori Takahashi

Department of Legal Medicine, School of Medicine, Toho University, Tokyo, Japan

By the tsunami occurred in the Indian Ocean at the end of last year, more than 200,000 of human life were lost. Since there are many famous resorts in the stricken area, a lot of overseas' tourists were also killed by that tsunami.

It is well known that dentists were dispatched from many countries and they performed victim's identifications by the method of the dental findings. Japan also sent several dentists to Thailand and Indonesia respectively. In Japan, more than 90 percent of people have a record of dentistry consultation, therefore, the dental findings are able to work as a very effective means for personal identification. Under such circumstances, there are six laboratories concerned to forensic odontology among 28 dental schools and in the most of those schools; forensic odontology is lectured to the students.

Furthermore, dental associations in cooperation with police are organized in every prefectures in Japan and it is established such system as they promptly set out and cooperate with police, once disaster or criminal case should be occurred. Dentist as a member of the said associations regularly receive the training how to take the dental findings and confirm the identity of person at postmortem inspection because it is thought that the skill of dentist to do the personal identification can be improved by the practice of daily cases.

Keywords: personal identification, dental findings, forensic odontology.

The dead-bodies required identification

148 cases of dead-body identification that I experienced in the past decade can be classified as follows. 48 skeletal remains (32.4%), 36 burned bodies (26.4%), 28 putrefied bodies (18.9%), 9 mummies and adipoceratous bodies (6.1%), 8 drowned bodies (5.4%) and 4 no records.

Two major means for personal identification

There are two major means for personal identification. One of them is a "morphologic method" such as dental findings, skeletal feature and fingerprints etc, and the other is a "genetic markers" such as DNA polymorphisms and a blood type etc. According to circumstances, either one may be applied, or both means may be used together for double checking.

Ratio of application of identification means

According to the data by the Saitama prefecture police in 2002, the ratio of means for personal identification was dental findings 26%, dental plus skeletal findings 15%. skeletal findings 14%, fingerprints 28%, DNA 4% and others 13%. Thus, the majority of dead bodies were actually identified by means of the hard tissue. However, such a wrong impression is prevailed by the mass media as a lot of personal identifications were made by means of DNA

Case introductions

Case1. Victim burnt by criminal

To conceal the victim's identity, the criminal tried to burn victim's body with kerosene. However, because only the body surface was burnt, teeth were flawlessly left. The teeth image of missing girl's dental film offered by the dentist was coincident with that of the corpse. Fig.1

Case2. Coincidence of palatine folds.

Because the flame have high temperature when a car is burnt, the body in the car was highly damaged. So it was difficult to collect useful samples for personal identification. In this case, the

denture was left on the palate though a maxilla and a mandible were burnt. The palatine folds patterns of this denture were compared with that of old denture offered by the family and it was judged that both patterns were the same. Fig.2

Case3. Body buried in the ground

Many pieces of human bones were discovered from the ground in the barton. However, the bones were only 85, the main bones such as skull, ribs, pelvis and femurs did not exist. The truth is as mentioned below.

Eight years ago, the corpse of the criminal's divorced wife (18 years old) was carried to his grandfather's house and buried in the garden. After several years, the grandfather dug the bones out of the garden and incinerated them. Therefore, the discovered bones were the pieces remained in the garden without digging

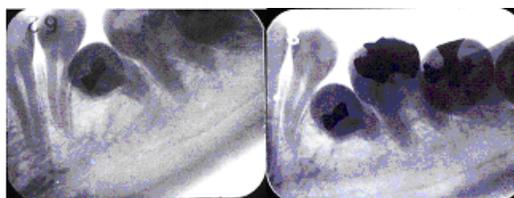


Fig.1 the right dental film is missing girl's offered by the dentist, the left is corpse's.

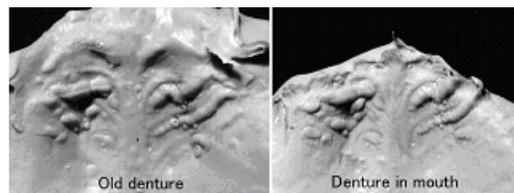


Fig.2 the palatine folds patterns of two dentures and it was judged that both patterns were the same.

out. Because the mandible was fortunately included in these remained pieces, we were able to identify with the X-ray film (pantomograph) kept by the police for eight years. When the victim disappeared, a detective immediately obtained her X-ray from the dentist as he presumed that she might be killed. Fig.3

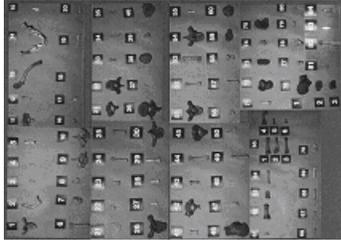


Fig.3 eighty five pieces of human bones discovered from the ground

Case4. The dentist treated the victim was not found.

A man's dead body mummified in the discarded car was discovered. His several teeth were capped with the gold and silver crowns. Three snap photographs of the man who was missed one and a half years ago, were submitted by the police. The colors of each tooth were able to be recognized from every photograph and the row of these colors was the same as these of corpse's teeth. The Colors read from snap photographs were white 11, silver 4, gold edge 2, gold 1, black (lack?)1. The numbers of color

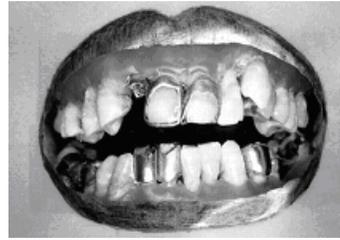


Fig.4 the front view of teeth alignment of the corpse. (Gum was restored with paraffin wax)

combinations were calculated by the formula of combination and the number of 63488880 was obtained. It was meant that the probability of the row of these colors was $1/63,488,880$. Fig.4

Conclusion

When 28 permanent teeth are distributed by "Existence" and "Absence", the numbers of combination are raised to the 28th power of two 270 million. Furthermore, when "Treated" is added, the combination becomes the 28th power of three 23 trillion. Actually, the person who has same treatment is extremely little because there are many kinds of dental treatment. Additionally, the dental roentgenogram has the same power of identifications as the fingerprints.

It is thought that personal identification by dental findings becomes more important internationally because the dental treatment is rapidly widespread in the developing country, too.