

THE ROLE OF FORENSIC ODONTOLOGY IN PERSONAL IDENTIFICATION: INDONESIAN PERSPECTIVE

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Abstracts

The central dogma of dental identification is the comparison between postmortem dental remains and ante-mortem dental records to confirm the personal identity. In mass disasters happened in Indonesia this method is almost impossible, since the ante-mortem dental record was usually not available. In this situation, however, postmortem dental examination is still useful to find the other general personal information, such as race, age, sex, blood group, eating habit, etc that will reduce the number of suspects (presumptive identification). DNA analysis performed from dental materials, such as enamel, dentin, cement and pulp, will confirm the identity of suspected / alleged person. We will report our techniques in handling such cases when ante-mortem data is not available based on several mass disasters in Indonesia, such as bombing cases, ship and airline accidents. In mass catastrophes and natural calamities, the primary identification method is based on the findings of fingerprint, forensic dentistry and DNA analysis. In real case, most of the personal identification is based on the finding dental (odontology) evidences, since the teeth are resistant to the environmental influence, and degradation compared to other parts of the body. It was proven thorough our investigations, that even when we were not supported by ante-mortem dental records, the information from post mortem dental examination is always useful for personal identification. To reduce the possibility of in-identified victims, in the future Indonesia needs to standardize dental record, make a nation-wide forensic odontology curriculum in Dental School, and provide the forensic odontology and DVI trainings for dentist .

Key words: forensic dentistry (odontology) – personal identification – DNA

Introduction

Forensic Odontology is the application of dental science to the administration of the law and the furtherance of justice. It provides an important community service in both civil and criminal jurisdiction.¹

Indonesia has experienced several major disasters which caused mass fatality in the last five years. They were Bali Bombings in 2002 and 2005, the JW Marriott Bomb Blast in 2003, the Australian Embassy Bomb Blast, the Asian Tsunami Disaster in 2004, and also several transportation accidents. Although methods of mass fatality management have been designed for either transport accidents, acts of terrorism, or even natural disasters, the remaining biological samples for further personal identification is still a very important issue.

Tooth as the hardest tissue in the human body is a very valuable sample. It does not only represent a suitable repository for such unique identifying features, it also survives from most postmortem events because of its resistency to degradation as well as environmental influences compared to other body parts. Tooth has often been used as a DNA source in mass catastrophes and natural calamities management.

In handling such cases in Indonesia, investigators have practiced forensic odontology as a reliable index in the identification of deceased victims. In this paper we present our findings from several case studies in Indonesia based on forensic odontology and make recommendations for future disasters.

Methods

Bali Bombing I

A team consisted of the Indonesian National Police (INP), the Australian Federal Police (AFP), the Australian Interpol, forensic professionals and volunteers gathered to manage the identification process according to agreed international standards.² The team had to work out in the first place to unite all investigators from many countries to integrate in an international team and to examine each body following the right procedure.

All researchers then collected all information about the victims as much as possible. Postmortem information gathered includes dental records, unique characteristics such as tattoos, scars and other details that might assist the identification process. The AFP and forensic professionals from Australia had no difficulty in collecting the ante-mortem data for the Australian victims. All available AM records for the Australian victims were gathered in just 10 days. Other foreign forensic odontologists managed to gather dental records as well. The examination continued to gather post-mortem data, concentrated on pathologic, dental, and DNA evidences. The investigators had to pull out the maxilla and mandible of each victim, cleaned them up, made polaroids as well as dental x-ray, and filled up the PM dental chart.

Since it was almost impossible to collect the AM dental records of the local victims, some identification had been relied on visual family recognition. Later identifications were based on DNA test, supported by the Australian government. The AM and PM data were compared to identify

Results and Discussions

victims and the process was reviewed by a Reconciliation Board. The Reconciliation Board consisted of Indonesia's DVI commander, an Australian forensic odontologist, and an Indonesian forensic pathologist.² As soon as the identification was considered correct, a death certificate was issued and the body was released to the family.

Bus Accident in Situbondo

The accident was followed by an explosion and a fire which caused burned victims. The possible method of identification was to use family information and recognition of the anterior dental profile.

Airline crash in Medan

The investigators were managed to collect AM dental records to identify some victims. Other victim identifications used PM dental evidence compared to AM face photograph and family/relative information about victim's AM dental condition.

Airline crash in Yogyakarta

Forensic odontology was majorly used to identify the un-survived victims. Comparison of the AM dental records to PM dental evidence was successfully established in identifying locals, Australians and other foreigner victims. Specific dental findings were collected to make the identification much easier. The dentists of the local victims and families voluntarily gave their contributions of AM dental information to help the investigators.

The severe burning of many victims made it impossible to determine exact racial groupings. Beside grouping the victims into Caucasian and non-Caucasian groups, the victim lists of the first Bali Bomb Blast showed many victims that were ethnically of Chinese origin but were citizens of Canada, the United Kingdom, the United States or Australia.² The identification process finally confirmed 202 people dead in which 199 people were successfully identified. More than 60 percent of victims of all nationalities were identified using dental evidence within three weeks after the incident, mostly the Australian victims.² During the investigation, 9 out of 18 people were shown to have been incorrectly identified by family visual recognition. This showed that only visual identification should not be carried out in such circumstances. Poor AM records or incomplete recovery of remains proved to cause problems during examination and time consuming. The Australian government helped to cover the costs of DNA analysis, irrespective of the victims' nationality. Tooth has been known as the hardest and most resistant tissue towards degradation.³ When body tissues have decomposed, the structure of the enamel, dentine and pulp complex still persist, and can be the only remaining part of the body, which can still be used for identification, especially when it contains sufficient unique characteristics and also excellent DNA material.^{1, 3, 4}

Personal identification by using dental characteristics played important roles in several accidents. By mostly family information and

recognition of the anterior dental condition, 33 people out of 55 victims (60 %) were successfully identified in a bus accident in Situbondo. Another example was shown when an airline got crashed in Medan. From 143 victims, consisted of both passengers and the people who lived around the accident scene, 109 people were successfully identified, in which 68 victims (62%) were identified by comparing PM dental record to AM family or relative information about victim's dental condition and face photograph.

After recent several mass fatality in Indonesia, the people of Indonesia learned how important it is to have a complete dental status recorded in their dentists dental record or even to keep a panoramic radiograph for each individual. This fact was shown when another airline accident happened in Yogyakarta. Twenty one dead victims were 100% identified mostly by AM dental information voluntarily given by the families and dentists as soon as the accident happened. They understood well that the investigators on the scene will need those informations. One victim was identified by visual identification, while the other 20 victims by combination of dental and other methods. One victim was identified by the presence of prosthesis and another one by super-imposed front teeth outline and spacings. The rest were identified using AM dental records in combination with other methods.

Conclusion and Recomend ations

Forensic odontology does play significant roles in personal identification of mass fatality or natural calamities. Indonesia has experienced quite a

few cases. Therefore it need to be ready to handle such situation. It is now a very important issue of the necessity to have an AM dental data collection of each individual, either kept by themselves or by their dentists. It is also very important to inform a better understanding of DVI fieldwork, to avoid unnecessary problems arise during the investigation.

From several incidents, the slowest part of the process is gathering the Ante Mortem dental data, so database build up of hard tissue status in oral cavity should be a mandatory procedure during routine health general check up. Besides, in order to avoid identification delays, more trained forensic dentists in personal identification and DVI are needed to handle the future mass disasters.

A mass disaster naturally attracts political and frenzied media interest; therefore, a good leadership from the DVI commander is a must especially when international forum is involved. Finally, it is our duty to inform the roles of forensic odontology to the people as well as dentists in Indonesia, in order to increase their awareness and participation when a mass fatality happens and when they are asked by the authority to identify the victims.

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