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The Tsunami Disaster in the Kingdom of Thailand 2004.

The sequence of events from the location of the victims to their repatriation. The leading role of the dental experts successfully embedded in the DVI operations.

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Introduction

The tsunami disaster on 2004 December 26th, triggered by the Sumatra Andaman Earthquake was one of the deadliest disasters in modern history and implicated a multinational large scale DVI operation in South- and Southeast Asia.

Objectives

Command Structures. The Thai DVI commander in the rank of a police general was the head of all DVI operations. He also commanded the TTVI-IMC in a hierarchical structure of all departments and staff involved as there were: logistics and IT, administration clerks, head of staff, ID board, secretary's office, DVI expert coordinators, AM/PM coordinators, reconciliation coordinator, missing persons coordinator, reconciliation manager, AM team leader, PM team leader, liaison officers, forensic odontologists manager, fingerprints manager, DNA manager, DNA experts, fingerprint experts, medico legal experts, anthropologists, police officers (Fig. 1). The court exhibits were catalogued, the photographic documentation shot, the fingerprints taken, the abdominal autopsy performed, the dental examination was performed including the dental X-ray examination also the DNA probing by extraction of two teeth and femur bone fragment biopsy. The PM data, as well as the AM data from the victims, were transfered to the "Thai Tsunami Victim Identification - Information Management Center", shortform "TTVI-IMC", and entered in a computerized database within they were matched.

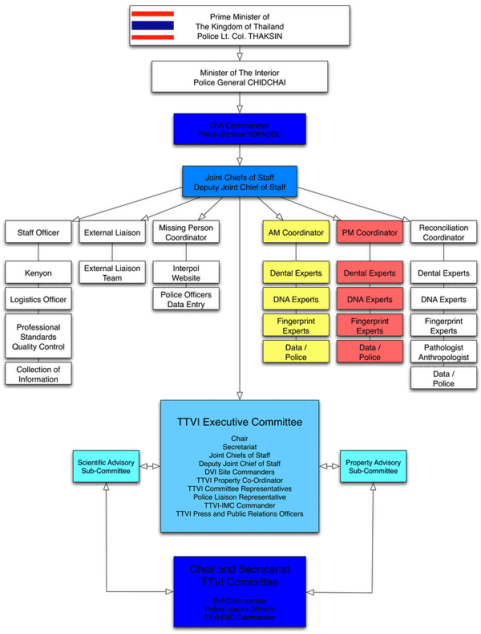

Fig. 1 Organigram of the DVI mission

Material and Methods

In this case where the number of victims was unknown and continued to increase during the initial phase, removal of the lower jaw only was recommended (Fig. 2). If possible, the upper jaw should remain in situ. When this was done, a V-shaped incision was made, beginning at the upper end of the sternal region, for dissection of the soft tissues. This permits exposure of the lower jaw. After disarticulation, the lower jaw as well as the upper jaw that remains in situ could be cleaned and then subjected to detailed dental examination as well as radiodiagnostics. As Sharpey's fibres were autolytically destroyed, the cleaning procedure has to be very carefully to ensure that all teeth remain in situ. The advantage of taking this approach is that, because the upper jaw remains in situ, a subsequent mix-up should be almost impossible. When everything is complete, the lower jaw is repositioned and the dissected tissue can be re-closed. This usually makes it possible to establish clearly if the jawbones belong together. The cases showing partial dentures (Fig. 3) and a detailed AM documentation, most suitable by photography, are all but solved. An identification number, being fixed in the dentures resin (Fig. 4), can be helpful, if carefully documented ante mortem. Unveiled third molars (Fig. 5) have been dissected for age estimation according to Demirijan. Implants (Fig. 6) are a highly individual detail and can be retraced even to the manufacturer. A tooth agenesis (Fig. 7), depending on the region in which it is expressed, is helpful in the identification of minors with little other individualities in their dental status. The comparison of post mortem and ante mortem radiographs (Fig. 8 and 9) is mandatory and leads in fact to irrevocable results. Describing these individual PM details leads to a high probability to meet or even surpass the I.O.F.O.S. quality assurance guidelines for identification after disasters. According to these guidelines identification is established if less than 1:10000 other person may fit the details.

Fig. 2 Dissected lower jaw

Fig. 6 Implant regio 34

Fig. 3 Partial upper denture

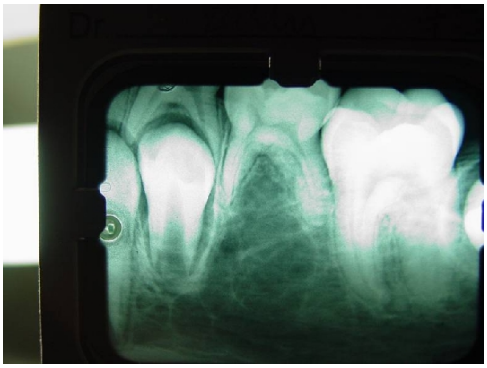

Fig. 7 Tooth agenesis regio 35

Fig. 4 Full upper denture

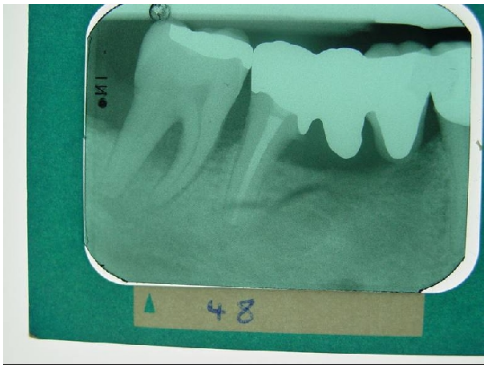

Fig. 8 Hemisectioned 47 ante mortem

Fig. 5 Tooth 38

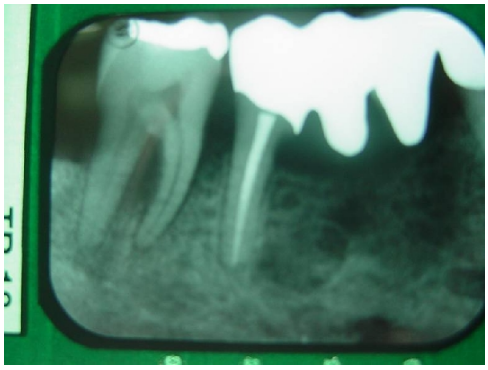

Fig. 9 Hemisectioned 47 post mortem

Results

From the 478 German victims identified in the Kingdom of Thailand, 83.7 percent (400) were identified by dental status, 13.2 percent (63) by fingerprints, 3.1 percent (15) by DNA.

Conclusions

The numeric results substantiated, that the vast majority of the victims was identified by dental identification, proving the leading role of the dental experts in a mass disaster scenario similar to the tsunami disaster as a cataclysm on an unprecedented scale. Dental identification played a particularly important role in the overall spectrum of scientific identification procedures. Especially the experience gained from the work carried out after the tsunami disaster has shown that, in addition to precise recording of the findings and documentation by means of X-rays, it is important to ensure that the respective dental findings can be checked at any time and clearly linked to the respective corpse.

Literature

1. James E. (2005) Thai Tsunami Victim Identification - Overview To Date.
2. J Forens Odonto-Stomatol, Vol 23, No1, pp. 1-18
3. Tore Solheim (2004) Identification after disasters. IOFOS Quality assurance guidelines, http://www.odont.uio.no/foreninger/iofos/quality/Disasters-IOFOS.htm

Abbreviations

TTVI-IMC = Thai Tsunami Victim Identification Information Management Centre
IT = Information Technology
I.O.F.O.S. = International Organisation of Forensic Odontostomatology

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

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German Society of Legal Medicine

German Academy of Forensic Odontostomatology

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A contribution of the German Academy of Forensic Odontostomatology

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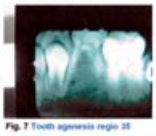

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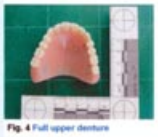

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Abstract

The tsunami disaster victims were recovered during the clear-up operations using heavy construction- and earth-moving-machinery, all sorts of vehicles, working elephants, search and recovery divers and additional action forces by water, by land and by air.

Within the „Mobile Forensic Medicine Center", the international DVI teams worked in shifts and performed the post mortem examination of each of the tsunami victims. The DVI teams comprised police officers, photographers, finger print experts, legal medicine physicians, forensic odontologists and DNA experts.

Command Structures

The Thai DVI commander in the rank of a police general was the head of all DVI operations. He also commanded the TTVI-IMC in a hierarchical structure of all departments and staff involved as there were: logistics and IT, administration clerks, head of staff, ID board, secretary`s office, DVI expert coordinators, AM/PM coordinators, reconciliation coordinator, missing persons coordinator, reconciliation manager, AM team leader, PM team leader, liaison officers, forensic odontologists manager, fingerprints manager, DNA manager, DNA experts, fingerprint experts, medico legal experts, anthropologists, police officers (Fig. 1). The court exhibits were catalogued, the photographic documentation shot, the fingerprints taken, the abdominal autopsy performed, the dental examination were performed including the dental X-ray examination also the DNA probing by extraction of two teeth and femur bone fragment biopsy. The PM data, as well as the AM data from the victims, were transfered to the „Thai Tsunami Victim Identification - Information Management Center", shortform „TTVI-IMC", and entered in a computerized database within they were matched.

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From the German victims identified in the Kingdom of Thailand, 83.7 % were identified by dental status, 13.2 % by fingerprints, 3.1 % by DNA.

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