International Poster Journal IPJ of Dentistry and Oral Medicine

Int Poster J Dent Oral Med 2006, Vol 8 No 02, Poster 315

What about Tsunami?

Procédure suivie dans une catastrophe impliqant un grand nombre de victims

Language: English

Authors:
Dr. med. Dr. med. dent. Klaus Rötzscher, Arbeitskreis für Forensische Odonto-Stomatologie, Speyer
Dr. med. Dr. med. dent. Claus Grundmann, Gesundheitsamt der Stadt Duisburg
Priv.-Doz. Dr. med. Rüdiger Lessig, Institut für Rechtsmedizin der Universität Leipzig
Dr. med. dent. Hans-Peter Kirsch, Saarbrücken

Date/Event/Venue:
29th and 30th September 2005
ASSOCIATION FRANÇAISE D'IDENTIFICATION ODONTOLOGIQUE (A.F.I.O:), XV ème Congrès
La Rochelle, France

Introduction

Prior to December 2004 these were the major recorded incidents of tsunamis:
31 December 1703
The Genroku earthquake resulted in a tsunami that killed 100,000 people in Awa, Japan.
1782
An estimated 40,000 people were killed by a tsunami that followed an earthquake in the South China Sea.
15 June 1896
Spawned by an earthquake, the Sanriku tsunami unleashed waves as high as 30 metres (100 feet) on the east coast of Japan, killing around 27,000 people, including many who had gathered to celebrate a religious festival.
28 December 1908
At around 5.20 am, Europe's most powerful earthquake shook southern Italy. Centred in the Strait of Messina, which separates Sicily from the mainland, the quake triggered a tsunami, causing 13 metre high (40 feet) waves to crash down on dozens of coastal cities. Many cities in southern Italy lost half of their residents that morning, the total death toll being estimated at 200,000.
17 July 1998
An offshore quake trigged a 12 metre high (40 feet) tsunami that struck the north coast of Papua New Guinea, killing some 2,200 people and leaving thousands more homeless.

Objectives

A priority was identified as the opening of the coastal roads and re-establishment of power supplies with the setting up of refugee camps in the affected areas as soon as practicable.
A secondary, but no less significant, need was to collect the deceased and bring them to central holding areas before disease and contagion spread. This was an area in which the Thai authorities sought international help.
However, initially, the Thai authorities were unable to countenance such a massive movement of bodies, in a manner which may have proved offensive to the Buddhist faith, and the idea of a central facility was rejected by them.
The Thai authorities decided to utilise the various Buddhist tempies or Wats, which abound in Thailand. These places have the advantage of being easily freed from their normal usage, and often have their own crematorium attached. In all societies, temples, churches and mosques are a source of comfort and soiace in such situations. They are also used as information centres and as collection points for the dead.
This was the case in Thailand, a predominantly Buddhist society and the attitude of the Buddhist monks should be highly praised.
Mortuary sites were subsequently established at Takua Pa (Sites 1 A & 1 B), Mai Khao (Site 2), and Krabi (Site 3).
Site 1A was established at the temple complex of Wat Yan Yao and 1 B at Wat Ban Muang (Fig. 4).

Material and Methods

The flow of bodies was designed to accommodate the various disciplines, with each discipline determining their specific requirements. Fingerprinting was identified as the first stage and this was established in an air conditioned tent at the entrance to the fixed mortuary. The bodies were then moved on the same table into the mortuary. Pathologists opted for a visual examination for surface features and a laparotomy to determine if any organs had been surgically removed antemortem (Fig. 5)

Fig. 4: Site 1A was established at the temple complex of Wat Yan Yao and 1 B at Wat Ban Muang

Fig. 5: The bodies were then moved on the same table into the mortuary. Pathologists opted for a visual examination for surface features and a laparotomy to determine if any organs had been surgically removed antemortem

The dental station was next where a full dental postmortem was performed with specified photographs.
The body then left the air conditioned area and went to dental radiography. Once the radiographs were checked and approved, two teeth were extracted for DNA analysis and the body returned to the care of the body handlers for placement in its designated container.
It was identified that the dental radiography process was the time limiting factor and a large area was therefore allowed for body holding.
With the generation of large numbers of radiographs (up to 200 per day) there were problems with film processing and film mix-ups. Assigning a single individual to accept, log, and process all radiographs resolved this issue. Ideally, this individual should adopt a quality assurance role that includes machine and chemical maintenance.

Results

As a result of the 1946 Aleutian Islands tsunami, which did so much damage hundreds of miles away in Hawaii, the countries of the Pacific Ocean established a tsunami warning system in 1949. At the Pacific Tsunami Warning Centre in Honolulu, geologists receive and analyse data provided by 120 seismometers located around the Pacific Basin. These seismometers measure ground motion and send signals as any movement occurs, thereby enabling any undersea earthquakes to be spotted instantly. Any ensuing tsunami is detected by a system of coastal tide gauges and deep ocean pressure sensors.
However in December 2004 the Indian Ocean had no such warning facility, partly because the governments of the Indian Ocean nations could not afford it but also because it was not deemed necessary. Historically, the Pacific had always been at far greater risk from tsunamis.

Fig. 1: The earth´s surface is made up of a series of plates. When they suddenly move together, an earthquake occurs

Fig. 2: The incredible power of the Tsunami was felt in countries across the 4,500 kilometre-wide Indian Ocean

Fig. 3: Banda Aceh felt the tremors with greater force than any other built-up area: Banda Aceh was the nearest large city of the epicentre of the massive undersea earthquake

Watching and Waiting
The earth's surface is made up of a series of plates. When they suddenly move together, an earthquake occurs (Fig. 1). The incredible power of the Tsunami was felt in countries across the 4,500 kilometre-wide Indian Ocean (Fig. 2)
It was at eight o'clock on the morning of 26 December that the 225,000 inhabitants of Banda Aceh, capital of the Aceh province on the Indonesian island of Sumatra, had the first indication that something might be wrong. Banda Aceh felt the tremors with greater force than any other built-up area: Banda Aceh was the nearest large city of the epicentre of the massive undersea earthquake (Fig. 3).

Conclusions

The antemortem and reconciliation phases of the process were co-ordinated at the Thai Tsumani Victim Identification Information Management Centre. The building was lent to the process by the Telecommunications Organization of Thailand and with some quick additional wiring, was suitable for the computer-linked phases of the operation. Those working in the building include police investigation teams, Interpol representatives, forensic odontologists, fingerprint and DNA experts, country liason officers and representatives of Kenyon International.

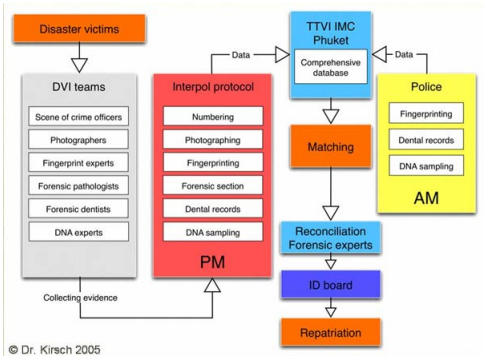

Fig. 6: Those working in the building include police investigation teams, Interpol representatives, forensic odontologists, fingerprint and DNA experts, country liason officers and representatives of Kenyon International. TTVI IMC PHUKET

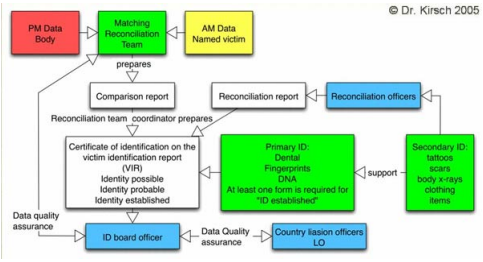

Fig. 7: Matching Reconciliation Team

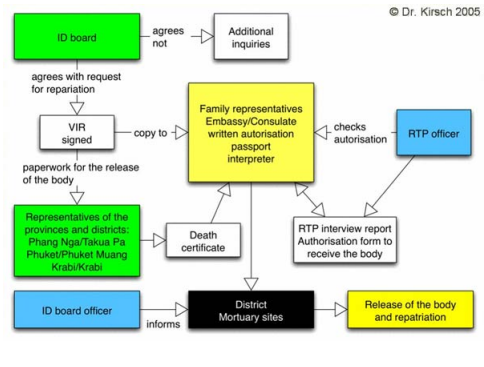

Fig. 8: ID-Board

Fig. 9: Destruction by Tsunami

Literature

- Tiballs G (2005) TSUNAMI. The world's most terrifying natural disaster. Carlton Books Ltd, London pp. 8-29
- James E (2005) Thai Tsunami Victim Identification - Overview To Date.
- J Forens Odonto-Stomatol, Vol 23, No 1, pp. 1-18

Abbreviations

TOT = Telecommunications Organization of Thailand
TTVI-IMC = Tsumani Victim Identification Information Management Centre

This Poster was submitted by Dr. med. Dr. med. dent. Klaus Rötzscher.

Correspondence address:
Dr. med. Dr. med. dent. Klaus Rötzscher
Arbeitskreis für Forensische Odonto-Stomatologie
Wimphelingstraße 7
67346 Speyer

Poster Faksimile:

AK FOS

A contribution of the German Academy of Forensic Odonto-Stomatology (AKFOS)

XV ème Congrès, La Rochelle: Jeudi 29 et vendredi 30 Septembre 2005
Association Française d´Identification Odontologique A.F.I.O.

Deutsche Gesellschaft für Zahn-, Mund- und Kieferheilkunde

Deutsche Gesellschaft für Rechtsmedizin

WHAT ABOUT TSUNAMI ?

PROCÉDURE SUIVIE DANS UNE CATASTROPHE IMPLIQUANT UN GRAND NOMBRE DE VICTIMES.

Roetzscher K, Grundmann C, Lessig R, Hirsch H-P

Abstract

The identification of the victims of Tsunami in South East Asia on December 26, 2004, was a great challenge for forensic odontology. Fingerprints, DNA-Analysis and dental records were used for the positive identification of the bodies. The forensic casework of the first days was reported from the odontological point of view. First positive identifications using direct contact were possible but show the problems also. The high potential of the forensic odontology allows the positive identification in approximately 90 percent of the victims using this method.

Introduction

Prior to December 2004 these were the major recorded incidents oftsunamis:

31 December 1703: The Genroku earthquake resulted in a tsunami that killed 100,000 people in Awa, Japan.

1782: An estimated 40,000 people were killed by a tsunami that followed an earthquake in the South China Sea.

15 June 1896: Spawned by an earthquake, the Sanriku tsunami unleashed waves as high as 30 metres (100 feet) on the east coast of Japan, killing around 27,000 people, including many who had gathered to celebrate a religious festival.

28 December 1908: At around 5.20 am, Europe's most powerful earthquake shook southern Italy. Centred in the Strait of Messina, which separates Sicily from the mainland, the quake triggered a tsunami, causing 13-metre-high (40 feet) waves to crash down on dozens of coastal cities. Many cities in southern Italy lost half of their residents that morning, the total death toll being estimated at 200,000.

17 July 1998: An offshore quake trigged a 12-metre-high (40 feet) tsunami that struck the north coast of Papua New Guinea, killing some 2,200 people and leaving thousands more homeless.

Materials and Methods

As a result of the 1946 Aleutian Islands tsunami, which did so much damage hundreds of miles away in Hawaii, the countries of the Pacific Ocean established a tsunami warning system in 1949. At the Pacific Tsunami Warning Centre in Honolulu, geologists receive and analyse data provided by 120 seismometers located around the Pacific Basin. These seismometers measure ground motion and send signals as any movement occurs, thereby enabling any undersea earthquakes to be spotted instantly. Any ensuing tsunami is detected by a system of coastal tide gauges and deep ocean pressure sensors.

However in December 2004 the Indian Ocean had no such warning facility, partly because the governments of the Indian Ocean nations could not afford it but also because it was not deemed necessary. Historically, the Pacific had always been at far greater risk from tsunamis.

Watching and Waiting

The earth s surface is made up of a series of plates. When they suddenly move together, an earthquake occurs (Fig. 1).

Fig. 1

The incredible power of the Tsunami was felt in countries across the 4,500 kilometre-wide Indian Ocean (Fig. 2).

Fig. 2

It was at eight o´clock on the morning of 26 December that the 225,000 inhabitants of Banda Aceh, capital of the Aceh province on the Indonesian island of Sumatra, had the first indication that something might be wrong.

Banda Aceh felt the tremors with greater force than any other built-up area. Banda Aceh was the nearest large city of the epicentre of the massive undersea earthquake (Fig. 3)

Fig. 3

Proceedings

A priority was identified as the opening of the coastal roads and re-establishment of power supplies with the setting up of refugee camps in the affected areas as soon as practicable.

A secondary, but no less significant, need was to collect the deceased and bring them to central holding areas before disease and contagion spread. This was an area in which the Thai authorities sought international help.

However, initially, the Thai authorities were unable to countenance such a massive movement of bodies, in a manner which may have proved offensive to the Buddhist faith, and the idea of a central facility was rejected by them.

The Thai authorities decided to utilke the various Buddhist temples or Wats, which abound in Thailand. These places have the advantage of being easily freed from their normal usage, and often have their own crematorium attached. In all societies, temples, churches and mosques are a source of comfort and solace in such situations. They are also used as information centres and as collection points for the dead.

This was the case in Thailand, a predominantly Buddhist society and the attitude of the Buddhist monks should be highlypraised.

Mortuary Sites

Mortuary sites were subsequently established at Takua Pa (Sites 1A & 1B), Mai Khao (Site 2), and Krabi (Site 3).

Site 1A was established at the temple complex of Wat Yan Yao and 1B at Wat Ban Muang (Fig. 4).

Fig. 4

Results

The flow of bodies was designed to accommodate the various disciplines, with each discipline determining their specific requirements.

Fingerprinting was identified as the first stage and this was established in an air conditioned tent at the entrance to the fixed mortuary. The bodies were then moved on the same table into the mortuary.

Pathologists opted for a visual examination for surface features and a laparotomy to determine if any organs had been surgically removed ante mortem (Fig. 5).

Fig. 5

The dental station was next where a full dental post mortem was performed with specified photographs. The body then left the air conditioned area and went to dental radiography. Once the radiographs were checked and approved, two teeth were extracted for DNA analysis and the body returned to the care of the body handlers for placement in its designated container.

It was identified that the dental radiography process was the time limiting factor and a large area was therefore allowed for body holding.

Personnel

On day one at Wat Yang Yao over 50 Thai dentists arrived ready and willing to work. In keeping with the directive that the Australian team was to aid and not control the Thai effort Dr Russell Lain was tasked with conducting a rapid training course in basic dental post-mortem procedures. This proved to be exceptionally successful and the Thai dental teams commenced their post-mortem examinations on day two, in sub optimal conditions, but with access to functional x-ray machines on site. When full mortuary operations commenced on day four, dentists from around the world had arrived to join the identification efforts.

Problems encountered

With the generation of large numbers of radiographs (up to 200 per day) there were problems with film processing and film mix-ups. Assigning a single individual to accept, log, and process all radiographs resolved this issue. Ideahy, this individual should adopt a quality assurance role that includes machine and chemical maintenance.

Conclusions

The antemortem and reconciliation phasesof the process were coordinated at the Thai Tsunami Victim Identification Information Management Centre (TTVI-IMC).

The building was lent to the process by the Telecommunications Organization of Thailand (TOT) and with some quick additional wiring, was suitable for the computer-linked phases of the operation. Those working in the building include police investigation teams, Interpol represen-tatives, forensic odontologists, finger-print and DNA experts, country liason officers and representatives d Kenyon International.

Fig. 6: TTVI-IMC Phuket

Fig. 7: Matching Reconciliation Team

Fig. 8: ID-Board

Fig. 9: Destruction by Tsunami

Bibliographic Data

1. Tibalis G (2005) Tsunami. The world´s most terrifying natural disaster. Carlton Books Ltd, London pp. 8-29
2. James E (2005) Thai Tsunami Victim Identification – Overview To Date. *J Forens Odonto-Stomatol*, Vol 23, No1, pp. 1-16

Corresponding address

Dr. Dr. Klaus Roetzscher
Wimpfelingstr. 7, D-67346 Speyer
roetzscher.klaus.dr@t-online.de