



The role of the forensic odontologist in disaster victim identification: Lessons for management[☆]

Anthony J. Hill^{a,*}, Ian Hewson^b, Russell Lain^{c,d}

^a Victorian Institute of Forensic Medicine and the Department of Forensic Medicine, Monash University, 57-83 Kavanagh Street, Southbank, Victoria 3006, Australia

^b Director Dental Services, Alfred Hospital, Victoria 3181, Australia

^c Oral Surgery and Diagnostic Imaging Department, Sydney Dental Hospital, Sydney, Australia

^d Department of Forensic Medicine, Glebe, Australia

ARTICLE INFO

Article history:

Available online 14 October 2010

Keywords:

Forensic odontology
DVI
Phase
Dental identification

ABSTRACT

Forensic odontologists are involved in all phases of disaster victim identification (DVI). The failure of DVI management to embed odontology teams within all phases of the investigation and to include them in management decisions throughout the operation may lead to delays in the reconciliation process and could possibly compromise the integrity of the DVI investigation. In the case study presented, trained and experienced teams of forensic odontologists were not utilised to full capacity in all phases of the investigation. The complexity of the initial scene investigation was not identified resulting in the incomplete recovery of all remains. The scene had to be re-examined on three subsequent occasions. The post-mortem examination of the remains had to be deferred until all subsequent material had been collected. The collection of all ante-mortem dental records was not undertaken, resulting in transcription information that was incomplete and compromised. As a result, the reconciliation (formal identification) of the deceased became problematic because of the compounded errors in all phases of this DVI investigation and the resulting odontological report of identification could have jeopardised the integrity of the entire DVI process. Following a review of this case and the recognition of possible areas of omission in the management of the investigation a strategy to address these problems is proposed.

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1. Introduction

On February 7th, 2009, 173 people died as a result of the 2009 Victorian bushfire disaster. Nine died whilst in hospital care with their identity known; the remaining 164 individuals were included on the DVI register of missing persons. Due to the confusion and panic on the day some residents remained to fight the fire whilst others made a late decision to leave. Human remains were recovered from eight motor vehicles; 14 scenes which were in the open; whilst the majority of deceased persons were recovered from 145 burnt out dwellings.

The primary accepted scientific means of identification of human remains, as recognised by the International Criminal Police Organisation (Interpol), are fingerprint analysis, molecular biological (DNA) analysis and dental comparisons. Secondary means of

identification may include a personal description of the missing person; anthropological information regarding sex, age and ethnicity; circumstantial evidence, property descriptions, documentation, and medical procedures known to have been undertaken by the missing individual [1,2]. Due to the prolonged extremes of temperatures reached during the firestorm and the duration of the fire, most secondary means of identification were destroyed.

This paper will deal with the role of the forensic odontologists during this Victorian bushfire disaster and in particular focus attention on the role the experienced odontologists could have played in management decisions to assist in the timely success of the identification/reconciliation process.

2. The role of the forensic odontologist

The primary role of the forensic odontologist during any DVI incident is the confirmation of the identity of a deceased person by the matching of post-mortem data and ante-mortem dental records of the missing person. This process is simple in concept, but it is complex in execution and requires the skills and expertise of fully trained and experienced forensic odontologists, working in teams [3].

[☆] This paper is part of the special issue entitled "Forensic medical response to the 2009 Victorian bushfires disaster". Guest edited by Olaf. H. Drummer and Stephen M. Cordner.

* Corresponding author at: Victorian Institute of Forensic Medicine, Human Identification Services, 57-83 Kavanagh Street, Southbank, Victoria 3066, Australia. Tel.: +61 3 9684 4431; fax: +61 3 9682 7353.

E-mail address: anthonyh@vifm.org (A.J. Hill).

Scenes which were examined during the Victorian bushfires contained deceased persons who were partially skeletonised, decomposed, incinerated and commingled. It is vital that 'first responders,' generally police units, involved in the examination of such scenes have appropriate and comprehensive training in the recognition of the complexity these scenes present. Expert scientific input from odontologists, anthropologists, pathologists and mortuary scientists at such scenes will ensure the complete recovery of all human remains [4]. Following the bushfire, some 86 scenes were re-examined to ensure that no human remains were overlooked. As a result of the effects of prolonged high temperature during the fires, dental structures and restorations were reduced to small, fragile and often separated remains. The presence of odontologists familiar with the minutiae of dental restorations and teeth, especially when they are loose within debris, has been successfully utilised in Victorian casework involving light aircraft fatalities, house-fires, motor vehicle accidents and previous bushfire incidents [5].

The examination of human remains is not taught at an undergraduate level and errors will inevitably occur if this is undertaken by untrained, inexperienced general dentists. If utilised they may appear to perform well at the time but they will carry an emotional legacy of the ordeal for many years. The stressful nature of the work within the mortuary should also only be undertaken by trained and experienced odontologists. Documentation of the evidence gathered and the interpretation of records received may appear simplistic, but the summary of the findings into a formal legal opinion document will have further compounding problems if undertaken by the inexperienced practitioner [6].

Ante-mortem dental records are generated following visits by patients for examination and treatment of their oral and dental health status. These records are not always in the form of written clinical notes detailing treatment undertaken. They may consist of radiographs, functional and aesthetic plaster casts of the dentition, orthodontic casts and photographs. Records may exist in several surgeries, especially if specialist treatment has been sought and it is imperative that complete ante-mortem records are obtained if an accurate representation of the dental status of the missing person is to be constructed.

It is impractical to expect a police member to understand the nuances of what constitutes a dental record. It is therefore essential, that as part of the DVI management structure, experienced odontologists are embedded within the ante-mortem section to assist police. The odontologists would be involved in making direct contact with the treating dentists and requesting, in detail, all relevant documents including information as to the source of further data. It would be the task of the police unit then to simply collect these documents.

Once examined by the forensic odontologists, any further dental records that may exist would be requested for collection. The significance of these supplementary records and their value in compiling a complete ante-mortem status of the missing person may be missed by the inexperienced examiner.

Once all ante-mortem dental records have been gathered it is the responsibility of the ante-mortem odontology team to compile a single master record summarising all available dental evidence. This information may be transcribed into a computer system if one is being used. The interpretation of the ante-mortem information and its transcription must be undertaken by experienced odontologists, trained in the complexities of the computer system, the language of the system, its codes and its capabilities. To delegate this task to an inexperienced dentist may result in errors of transcription and compound problems during reconciliation.

The comparison of the post-mortem dental data with the single master record of ante-mortem material can be undertaken once all

transcription is complete. Rarely do the two records match in all respects and judgement is required by odontologists to determine the significance of these differences and their bearing on the reconciliation process [7]. Apparent inconsistencies need to be explained and reconciled.

This, again, is a task that can only be undertaken by qualified forensic odontologists.

3. Case study

On Saturday 7th February 2009, during the height of the bushfires, a decision was made by two individuals to evacuate a house and property that was under threat. Although no fire was visible in the surrounding area it was estimated that the fire was approaching at 120 kph, driven by winds of 200 kph [8]. Finding their escape path blocked by burning debris and dense smoke they returned to the family home. It was from the home that telephone contact was made with a family member stating the two were seeking refuge inside the house.

The following day, Sunday 8th February, the property was found to be totally destroyed. It was searched and examined by police and emergency units. In the initial investigation of the scene, human remains were discovered within a bath and also in the immediate vicinity of the bath (Fig. 1). After documenting and photographing the scene, the remains were transferred to the Victorian Institute of Forensic Medicine (VIFM) for post-mortem examination. When it was reported that the remains were incomplete the scene was re-examined and further remains discovered. A third examination of this scene, with assistance from odontologists, found even more fragmentary remains.

All remains recovered from the scene underwent a full CT scan on admission to the mortuary. Due to the total destruction of all digits, no fingerprints could be taken. No property, clothing, jewellery or documentation was recovered from the scene. An



Fig. 1.

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