

**Comparative dental identification - A concise Review**

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**Abstract**

Forensic odontology is defined as “that branch of dentistry, which in the interest of justice, deals with proper handling and examination of dental evidence, and with the proper evaluation and presentation of dental findings” by (FDI) Fédération Dentaire Internationale. There are two important forms of postmortem dental identification: the first is , known as comparative identification, and the second is reconstructive identification. Depending on the age of the person due to rigor mortis, oral autopsy shows variation. Autopsies are required in adult operations, like skin dissection ,jaw

removal for a visual scope for non-viewable cases. To determine human identity the comparison between antemortem and postmortem has long been established. Important thing to remember is that any attempt at establishing identity is addressed to the police or legal authorities. This review is to show the Dental identification procedures highlights of forensic in person identification and about the newer techniques used in this current era.

**Keywords:** Forensic Odontology, Forensic autopsy, dental records, Reporting, Legal report writing.

## Introduction

Teeth are the hardest and strongest tissues of the human body. They are resistant to decomposition in major accidents, crime, burial, or other severe exposure to the elements. The dental patterns are unique for every and every individual. This uniqueness is due to the variety of treatments given by the dentist. Therefore, dentition of a person is useful for individual identification and comparison, if records exist for the purpose.[1]

Forensic odontology is proper handling, examination, and evaluation of dental evidence, that will be presented in the interest of justice. The evidence that may be derived from the teeth, the age (specifically in children) and identification of the person to whom the teeth may belong.

Knowledge of forensic dentistry requires an encompassing a number of disciplines, since the dental records obtained can identify an individual or afford the information needed by the authorities to establish identification of the case. (2) Within the field of forensics, dental evidence is considered to be the most trustworthy method of identification.[3] Comparative dental identification is the conventional method of postmortem dental identification, and includes four steps, namely[4]:

### Oral autopsy

Oral autopsy refers to an elaborate examination of the oral cavity, as teeth are most resistant to decomposition and can be used as a reliable means of human identification.[5]

### Obtaining dental records

Dental records are very important and often play a key role in the personal identification of persons who are beyond visual recognition. It is a member of the legal profession, frequently the police, who calls upon the dentist for the process of identification.[6,7]

Comparing postmortem and antemortem dental data- Identification of a deceased individual by comparing antemortem and postmortem records is more reliable and easier as compared to other methods.[8]

Writing a report and drawing an opinion-The Basic Requisites [9]:

- The report must fulfil the national guidelines comply with national laws
- The report should be written in a systematic way and it can be understandable by the lay person.
- The report should explain the cause of death (trauma or violence) on the basis of orodental findings.
- If possible the raw data or the worksheet should be provided by the forensic odontologist along with the report.

### Dental Identification Procedures

There are mainly two types of postmortem dental identification: the first is known as comparative identification, which attempts conclusive identification by comparing the dead individual's teeth with dental records presumed to belong to the same individual. However, it is possible when some clue (through circumstantial evidence) exists about the identity of the deceased (e.g. , passenger list of victims in a accident). The second is reconstructive identification, which attempts to elicit the population affinity sex, age, stature, and occupation of the dead subject. This is undertaken when virtually no other options exists about the identity of the decedent (e.g. , a skull recovered from a desolate location).[4]

The classic comparative dental identification makes use of both post-mortem and ante-mortem dental records to determine similarities and exclude discrepancies.[10] Odontological identification is based on systemic comparison of pre and post mortem dental characteristics of individual based on their dental records including

radiographs. [11] In many cases the tentative identification of the individual is unknown and therefore ante-mortem records cannot be located. In such cases a dental profile of the individual is developed to aid the search for the individual's identity. [10]

### **Oral Autopsy**

The meaning of autopsy is "to see for oneself," and in the present context, it denotes the postmortem examination of the dead. [12] There are three types of autopsies - anatomical autopsy for teaching the medical and paramedical students, pathological autopsy for evaluating the extent of disease after the death of the patient, and medico-legal autopsy performed to aid the judiciary system. [13]

The autopsy shows variations depending on the age of the person due to rigor mortis. Particularly, autopsies of adults need operations, such as skin dissection or jaw removal to obtain a visual scope for non-viewable cases. [14-17]

Oral autopsy may help; in troublesome cases where oral examination cannot be completed due to accessibility, for proper visualisation of teeth and its structure oral autopsy is necessary. [18] With the help of oral autopsy a proper postmortem record can be made.

### **Obtaining Dental Records**

A dental record is a legal document that contains all subjective and objective information about the patient and it is in the possession of the dentist. [19] Dental identification is broadly performed by two means. The first is to examine previous dental records of the person suspected as departed and look for these dental characteristics in the departed person for similarity and confirmation.

The second means entails that previous records are not present, a PM dental profiling is done that will give clues to narrow the search required for AM materials to

identify the deceased person. [20] A dental record should contain the name, age, sex, location, occupation, the number of teeth present, medical conditions, filled teeth, dentures and other restorations, and morphological variations of teeth and mucosa with photographs and radiographs, etc., [21]

Dostalova et al. in their study described a new digital imaging called Dental Cross, comparable to dental records for positive identification.

The program shows detailed dental examination, treatment history, dental chartings, and images, including x-ray and photo documentation, for example, implant picture or root canal in one screen in a concentrated, detailed manner. Facilities for colour coding and special notes are also available in this program. They perceived Dental Cross as an alternative source of information for searching victims. [22]

### **Comparing Postmortem and Antemortem Dental Data**

The comparison of ante-mortem and postmortem dental records in forensic odontology is to determine human identity has long been established. Indeed, it is still a major identification method in criminal investigations, mass disasters, grossly decomposed or traumatised bodies, and in other situations where visual identification is neither possible nor desirable. [23]

An individual with multiple dental treatment and unusual features has a better likelihood of being identified than someone with no remarkable dental characteristics. However, this does not imply that identification relies on extensive dental treatment; comparison should take into account quality rather than quantity. [4]

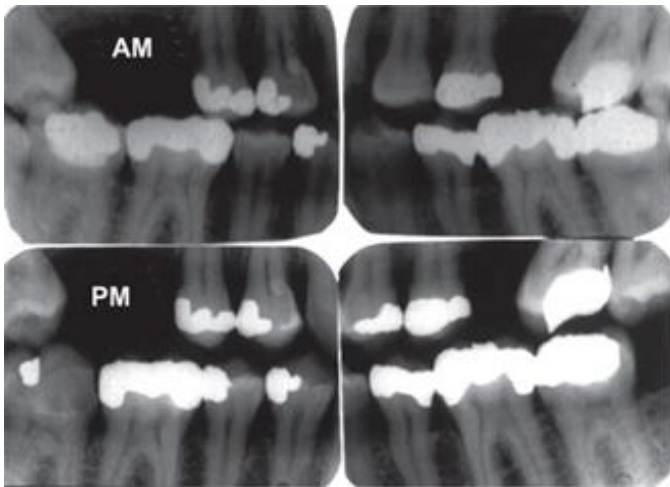


Fig. 1:Antemortem (AM) and postmortem (PM) bitewing radiographs

A comparison of antemortem (AM) and postmortem (PM) dental records is considered to be a dependable method in determining human identity.[24]

#### Writing a report and drawing an opinion

Most important thing to remember about writing a report is that any attempt at establishing identity is addressed to the police or legal authorities. Therefore, a detailed report of forensic investigation and factual opinion based on the comparison must be clearly stated. [4]

#### Guidelines for report writing [25]

- The report must fulfil the national guidelines complying with national laws
- The report must explain the cause of death (either due to trauma or violence) on the basis of orodental findings.
- Should be on official paper.
- All the basic information should be given ( Forensic odontologist's name, Institution, date, address, email )
- Obtain informed consent to the oro dental examination or alternatively view (and retain a copy of) a court order.
- Date and address of examination
- The date and every single detail of the body, when it was found, etc.

Finally, a report should be submitted to the relevant authority with the signature of the forensic odontologist along with date, place, qualification and the statement that the work and interpretation was done to the best of his/her ability. The agreement of three forensic odontologists on the conclusion is mandatory.

#### Conclusion

This article aims to provide an overview into the importance of dental identification procedure. Forensic odontology plays an important role in identification of a deceased person or culprit. Postmortem oral findings should be recorded properly for future comparison with antemortem records. Dental identification procedures are important for those individuals who cannot be identified visually or by other means.

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