Effectiveness of dental records in human identification

Efetividade da documentação odontológica na identificação humana

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ABSTRACT
Forensic dentistry, a branch of the forensic sciences, plays an important role within postmortem human identification, especially in cases of corpses that are charred, skeletonized or in an advanced state of decomposition. Identification of human remains via dental knowledge is done using a comparative technique, which is simple, inexpensive and reliable, the aim of which is to compare dental records and information recorded by dentists in clinical appointments made before an individual's death, with postmortem dental records obtained via forensic examination. In this context, the present study aims to demonstrate the importance of dental records and the effectiveness of forensic dentistry in human identification, illustrated by the report of a case that was conducted at the São Luis Coroner’s Office in the Brazilian state of Maranhão. It may be concluded that dental records maintained by a dentist, when complete, properly structured and correctly archived, retain important personal information and are fundamental tools in the process of human identification.


INTRODUCTION
Forensic dentistry is a challenging branch of forensic science, which combines dentistry and law and is based on the application of dental knowledge in order to provide assistance to the justice system.

Within the scope of forensic dentistry is its use in criminal law, encompassing the examination of whole or fragmented corpses in order to identify them. This is done by dental surgeons who are forensic experts for the Coroner's Office.

Identification is the process by which an individual's identity is determined, defining individuality and establishing characteristics and peculiarities that differentiate one individual from another. This endeavor is indispensable on account of the ethical, legal and civil reasons involved. Every family has the right to bury a deceased family member. At the same time, without identification of the corpse, many civil proceedings cannot
Dental documentation and human identification

Satisfactory results is directly linked to the quantity and quality of the information contained in these records. Conversely, flaws in these records may lead to the loss of relevant data, making identification difficult or even impossible.

In cases where dental records are not available, forensic dentistry seeks to create a profile that indicates the individual's oral habits, diet and probable age. It may even be possible to determine the individual's socioeconomic status.

In this context, the present study aims to report on a case of identification of a body at an advanced stage of decomposition using forensic dentistry and thereby highlight the importance of dental records.

CASE REPORT

In 2014, a corpse was found in the sea off São Luis, in the Brazilian state of Maranhão, and was delivered to the Coroner's Office to undergo forensic tests in order to determine the cause of death, the instrument or means that caused the death and the victim's identity. Visual recognition was not possible as the corpse was in an advanced stage of decomposition and was partly skeletonized. There was soft tissue in the cranial region, black hair partially dyed red and an absence of upper limbs, which made the use of fingerprint analysis to identify the corpse impossible.

Forensic dentistry was the methodology of choice for identification, as the dental arches were intact.

To examine the corpse's teeth, a bilateral incision was made from the labial commissure to the zygomatic arch exposing the dental arches. Forensic dental analysis of the corpse showed several characteristics of forensic importance, such as amalgam fillings, extractions and bad tooth position.

Relatives of the missing young woman, who had last been seen at the beach, claimed the body at the Coroner's Office. They were then asked to provide any dental records they had, as well as current photographs of the woman smiling. They provided a photograph of the supposed victim and her dental records from 2006, which revealed that some dental procedures had been performed (Figure 1). The relatives then answered a questionnaire and stated that the supposed victim had black hair, partially dyed red, and had upper anterior crowding.

The particularities found in the antemortem (AM) and postmortem (PM) examinations can be seen more clearly in the table below (Table 1).
DISCUSSION

Forensic dentistry contributes to the process of human identification via detailed studies of individual dental characteristics. To this end, the availability of a victim’s dental records is necessary. The fundamental aim of these records is primarily clinical, however, in some situations, they have significant legal value, contributing to legal issues such as forensic identification.15

In the present case, teeth #16 (maxillary right first molar), #14 (maxillary right first pre-molar), #24 (maxillary left first pre-molar) and #36 (mandibular left first molar), which on the dental records were shown to have amalgam fillings on their occlusal surfaces, corresponded with the findings of the autopsy (Figure 2). It is important to note that the dental surgeon identified the material used in the fillings and sketched the surface of the affected teeth on the odontogram.

Tooth #26 (maxillary left first molar) was found to be reduced to root fragments. In the dental records,

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Table 1. Forensic dental comparison of antemortem (AM) and postmortem (PM) information.

<table>
<thead>
<tr>
<th>Tooth</th>
<th>Antemortem (AM) information</th>
<th>Postmortem (PM) information</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>Amalgam filling on occlusal surface</td>
<td>Amalgam filling on occlusal surface</td>
</tr>
<tr>
<td>14</td>
<td>Amalgam filling on occlusal surface</td>
<td>Amalgam filling on occlusal surface</td>
</tr>
<tr>
<td>13</td>
<td>Proclined</td>
<td>Proclined</td>
</tr>
<tr>
<td>12</td>
<td>In contrast to teeth #13 and #11, turning in towards palate</td>
<td>In contrast to teeth #13 and #11, turning in towards palate</td>
</tr>
<tr>
<td>24</td>
<td>Amalgam filling on occlusal surface</td>
<td>Amalgam filling on occlusal surface</td>
</tr>
<tr>
<td>26</td>
<td>Indicated for endodontic treatment</td>
<td>Reduced to root fragments</td>
</tr>
<tr>
<td>36</td>
<td>Amalgam filling on occlusal surface</td>
<td>Amalgam filling on occlusal surface</td>
</tr>
<tr>
<td>46</td>
<td>Extracted</td>
<td>Missing, with remodeled bone ridge</td>
</tr>
</tbody>
</table>

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Dental documentation and human identification should be stressed. It should be noted that it is not possible to establish a minimum number of consistencies to determine positive forensic dental identification, as the study deals with both quantitative and qualitative elements.

CONCLUSION

Forensic dentistry is an efficient and safe method of human identification. However, the availability of antemortem dental records for comparison is required in order to ensure success. In the case study shown, the clear and correct clinical recording of the dental procedures performed, including information on the material used in fillings and the affected dental surfaces as well as records of the extraction performed, among other factors, facilitated and enabled identification of the victim. In cases where there are incorrect records, which use acronyms or abbreviations that are difficult to understand, do not specify the materials used and dental surfaces affected, omit procedures performed or describe procedures that have not been performed when they have, the identification process would be impaired or even rendered unviable. Therefore, dental professionals working in clinics have an important role to play in the identification process, contributing directly via the production of dental records that are in compliance with recommended ethical and legal parameters.

Collaborators

SM ALMEIDA took part in the design, outline, preparation, research and composition of the article. F DELWING, JAP AZEVEDO, RKT NOGUEIRA and FP FALCÃO took part in the revision, research and composition of the article. SPM CARVALHO directed the research and took part in the outline, preparation, research, revision and composition of the article.

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Received on: 24/6/2015
Final version resubmitted on: 3/8/2015
Approved on: 31/8/2015