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Case report

How to do identify single cases according to the quality assurance from IOFOS. The positive identification of an unidentified body by dental parameters: A case of homicide

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ABSTRACT

The positive identification of skeletal by individual dental parameters is one of the objectives of the criminal investigation. The intervention of Forensic Dentistry in some circumstances may represent the only way to obtaining a positive identification of an unidentified bodies. The teeth constitute a scientific method in forensic identification, principally due to the great resistance to the agents who provoke the destruction of the soft tissues in the corpses (putrefaction, traumatic, physical and chemical agents) and to the high morphological variability of the human teeth. The human identification in Forensic Dentistry is made by two ways: comparative and reconstructive. The identification allows to determine several parameters of forensic interest: specimen, population affinity, sex, age, stature and individualization's factors. The Forensic Dentistry is one of the most important fields in individual identification, because teeth have less variability in the chronology of events in terms of the reconstructive way. On the other side, in terms of the comparative way, this area is also important, because of the individualization's factors: positive identification in individual cases and in mass disasters. In this forensic case report, a homicide case, the objective of the medico-legal investigation was a positive identification of the unidentified corpse found one year after the crime, July 2010. The Portuguese Criminal Police of Lisbon, Homicide Group, requested to South Branch of the Portuguese National Institute of Forensic Medicine, a forensic examination by a Forensic Odontologist for dental positive identification. The objectives were: 1) *post mortem* reconstruction of the dental status of the victim; 2) obtain the *ante mortem* information of the presumable victims; 3) comparison of the *post mortem* information with the *ante mortem* information, for a positive identification of the presumable homicide victim. Materials and methods: in this field of dental investigation, the guidelines of the International Organization of Forensic Odontology were used for reconstruction of the *post mortem* dental profile, to register *ante mortem* information of the presumable victims and to compared for individualized dental factors, by using Interpol DVI Forms for Individual Case, *post mortem* and *ante mortem* forms F1 and F2. Results: the unidentified victim of homicide was positive identified where it was established the identity by more than 12 individual dental characteristics. Conclusion: the Forensic Dentistry is a very important and simple field for individual identification of unidentified corpses for application of the criminal law.

1. Introduction – events' history

On the 27 of July of 2010 an unidentified skeletal was found, near a Portuguese city Cascais by the Portuguese Criminal Police and related to presumable homicide crime one year before in June of 2009 with a disappeared man. For application the sanction of penal Portuguese law, homicide crime, it is necessary the identification of the victim.

In the same day was requested the forensic examination by a Forensic Odontologist at the South Branch from the Portuguese National Institute of Legal Medicine for a positive identification of the unidentified body. This was realized on the 5 of August of 2010.

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2. Oral autopsy

2.1. Post mortem identification

The body was carried in a body bag and was manual inspected for discovered all bones and teeth. For Forensic Dentistry was important the presence of the skull with the upper jaw, the lower jaw and the isolated teeth (Fig. 1). The skeletal was incomplete with age between 30 and 50 years old.

The point 45 of the *post mortem* D Interpol Form was verified[1]: there were dental fillings, dental prosthodontic rehabilitation with crowns and bridges, and the presence of the upper and lower contention in the lingual/palatal surfaces of the anterior teeth suggested *ante mortem* orthodontic treatment (Fig. 2).

The *post mortem* F1 Interpol Form was verified. The teeth were identified with the two digits according to the FDI system.[2] The upper and lower jaws were completed (Fig. 3a and b). On the vestibular surface of the alveolar bone related to the teeth 12, 13 and mesial root of the 46 were verified fractures occurred at the *post mortem interval*. There was observed *post mortem* loss of the teeth 21, 22, 35, 43 and 45. These were explained by the manipulation of the cadaver at the crime scene. There was no evidence of *ante mortem* traumatic lesions in the jaws. Was discovered in the body bag the following isolated teeth: 11, 13, 23, 34, 44 and 32 to 42 (maintained together by the metal alloy from the splint, Fig. 1). The anatomy of the skull and lower jaw was compatible with a man.

According to the guidelines from the International Organization of Forensic Odontology (IOFOS),[3] the forensic report of individual identification must contain also the F2 Interpol *post mortem* form. The oral autopsy was performed to fill this form by the codes according to the System of Solheim.[4] The point 86, Dental findings with the odontogram, of this form was filled with this information:

- The missing teeth (code X) were 18, 17, 16, 15, 12, 24, 25, 26, 28, 38, 37, 36, 47 and 48.
- The teeth lost *post mortem* (code Y) were 21, 22, 35, 43 and 45.
- The sound teeth (code S) were 13, 11, 23, 34, 33, 32, 31, 41 and 42.
- The filled teeth (code F) were: 14 (F am D, F t MOD), 27 (F am O), 44 (F am O mes, F am O dis) and 46 (F am ODL, F t V).
- The teeth with crowns (code K) where the abutment were osteointegrated implants of titanium alloy and the prosthodontic rehabilitation was porcelain–metal: 12, 37 and 36 (Fig. 4a and b).
- The bridges (code B) where the abutments were osteointegrated implants of titanium alloy: bridge with 2 elements, 16 and 15, where the abutment replacing the 16 was an implant with a cantilever to 15 (pontic bridge) performed with porcelain–metal prosthodontic (Fig. 5); and the other bridge with 3 elements from 24 to 26, where the 24 was a cantilever (pontic bridge) and the 25 and 26 were replaced by implants abutments rehabilitated with porcelain–metal prosthodontic (Fig. 6a and b).

Fig. 1. The skeletized body was incomplete, with age between 30 and 50 years old. The upper and lower jaws were complete.

Fig. 2. The lower jaw: the anterior teeth had a fixed orthodontic contention with metal alloy and composite at the lingual surfaces. This forensic observation is compatible with *ante mortem* orthodontic treatment.

The point 87 from the F2 *post mortem* form (Specific description) was filled with the oral autopsy information concern with:

- The color of the prosthodontic rehabilitation was monochromatic compatible with A3 from Vita Scale Color from Ivoclar®.
- The implant from 12 had *ante mortem* alveolar bone loss.
- All the prosthodontic implant rehabilitation were cemented and not screwed.

The point 88 from the F2 *post mortem* form (Further findings) was filled with:

- Presence of orthodontic contention in lingual/palatal surface of upper teeth (from 11 to 23) and lower teeth (from 33 to 42, no information about 43, *post mortem* lost), with metal alloy and composite resin. This finding was compatible with orthodontic treatment during life, in a period of time just near the time of dead.
- Green pigmentation in distal root from vestibular surface of the 46 tooth compatible with amalgam filled corrosion.
- Alveolar bone loss of 7 mm in 27 tooth from vestibular and palatal surfaces with the furcation area visible.
- The surfaces of temporomandibular articulations without morphological alterations compatible with pathology.
- Occlusion with canine guide between the 33 (occlusion attrition in vestibular surface) and the 13 (occlusion attrition in the cusp).
- Without smoking pigmentation.

The supplementary examination performed were photography's and intensification images (point 90 of the *post mortem* form). The tooth 46 had an image compatible with root filled and metallic post in distal root (Fig. 7a and b). The estimated age was between 35 and 45 years old using clinical method (point 91 of F2 form).