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Forensic Odontology: An Overview

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Writing an editorial for anyone is off course not an easy job, however, it's my immense pleasure to take this opportunity that in **International Journal of Drug Research and Dental Science.** Here I am dealing with forensic odontology. The word forensic is derived from the Latin forensic, which means 'before the forum'. According to Jones, in ancient Rome, the forum was where trials and debates took place and consequently served as a court of law. On the other hand, odontology refers to the study of teeth or dentistry. Forensic odontology, therefore, has been defined by the Federation Dentaire Internationale (FDI) as "that branch of dentistry which, in the interest of justice, deals with the proper handling and examination of dental evidence and with the proper evaluation and presentation of dental findings".[1]

The identification of human remains is one of the most essential aspects of forensic science. Beyond the humanitarian considerations of such a task, identification is essential for the completion and certification of official documents such as death certificates, probates of wills and disbursements of benefits and insurance. Common methods used for the identification of the deceased include the visual, personnel and scientific approaches. The scientific method is the most appropriate as it is reliable, valid and less error-prone. Conventionally, finger-prints, palm-prints and foot-prints are some of the science-based forensic approaches. However, these methods rely largely on the preservation of soft-tissue components of the body in question.[2]

Dental identification is the preferred scientific approach wherein the variation of teeth, jawbones, and sinuses could be exploited to its best use. Since teeth and bones being more resilient, they can withstand decompositional / destructional forces well. In addition to this preservation of this radiograph of these structures are also well suited for identification. Radiographic-assisted identification will provide objective information including the precise recording of the uniqueness of every individual. Radiographic identification of the deceased in the unlikely events as in mass disaster is routinely practiced.[2]

The application of radiology in forensic sciences was introduced in 1896, just 1 year after the discovery of the X-ray by Roentgen, to demonstrate the presence of lead bullets inside the head of a victim. Forensic Radiology usually comprises the performance, interpretation, and reportage of those radiological examinations and procedures that have to do with the courts and/or the law.3Imaging techniques are a powerful tool in forensic science. The radiologist should be aware of the importance of storing radiographs over prolonged periods of time and efficient record-keeping methods, because various legal problems may require the radiograph for additional interpretation or their presentation in court.[4]
Dental radiographs constitute crucial information that plays an important role in the registration, detection, collection and preservation of forensic evidence. These records are of major significance during comparative dental identification, postmortem profiling and certain age estimations.[5]

Today, radiographs are a common diagnostic tool, widely used in dental practices, hospitals and health services throughout the world. Storage facilities exist in most health institutions that keep radiographs over long periods of time.

Radiographically assisted dental identification may be comparative or reconstructive in type. The former "compares" ante mortem radiographs with postmortem radiographs. Reconstructive identification may use radiographs as an aid in the generation of a biological profile of a person for whom the putative identity remains unknown.[6]

Radiographic records provide objective evidence of the anatomical conditions and the dental treatment provided up to the point in time. Most cases of comparative identification use radiographic evidence of dental intervention (restorations, root fillings, crowns, extractions, etc.) as common points of identification. Less commonly, anatomical features are used as concordant points. Dental interventions, especially restorative ones, in many cases provide unique identifiers that are common in ante mortem and post mortem examinations.[4]

Radiography being a nondestructive method also plays a vital role in forensic dentistry to uncover the hidden facts, which cannot be seen by means of physical examination. The conventional radiographic methods allow the observation of anatomical characteristics such as coronal shape and size, pulp anatomy, positioning and shape of the alveolar bone crest, besides unique and individual characteristics resulting from dental treatments.[6]

The identification technique utilizing conventional radiography is of much importance in Forensic Odontology for age and gender determination. Various radiographic images that can be used in Forensic Odontology are intraoral periapical radiographs, lateral oblique radiographs, cephalometric radiographs, panoramic radiographs and advanced imaging techniques. Recently Digital radiographs have also gained importance in comparison between ante-mortem images recorded in dental offices and centers with post-mortem radiographic images for individual identification.[4]

This along with the facility of the internet has made Dentomaxillofacial radiographs, a useful tool in forensic science. The dental and craniofacial radiograph is an important assessment tool in a race, gender, and stature due to diversity in human physical constitutional makeup. With the recent advancement of technique such as CT, Micro CT, MRI, and OPG, CBCT also aids in forensic odontology.[7]

CBCT has often been described as the "gold standard" for imaging the oral and maxillofacial area and will no doubt become a part of the everyday life of most practices in the coming decades.[8]

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