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ISSN: 2161-1122
Dentistry

Short Communication

Forensic Odontology Responsibilities in Victim Identification

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DESCRIPTION

Every year, millions of people are killed by natural (earthquake, drought, and tsunami) and man-made (terrorism/homicides/suicide bombing) disasters. Such traumatic occurrences may result in a large number of unidentified victims, which is when forensic science's methods are used to identify them. The most common procedures are physical identification of bodies/corpses, fingerprinting, dental comparison, and Deoxyribonucleic acid analysis [1]. When physical identification and fingerprinting aren't possible, one of the most reliable and extensively used methods of identification is dental identification, which is based on comparing ante-mortem and post-mortem records. Forensic Odontology is a unique field that deals with evidence from dental and oral structures. Forensic dentistry, also known as forensic odontology, is the practice of dentists assisting and participating in legal and criminal cases. It relates to the proper treatment, examination, and appraisal of dental evidence before it is presented for legal purposes. Teeth can be used to determine the age (in children) and identity of the individual whose teeth they belong to. Dental records or ante-mortem (before to death) images are used for this. A forensic odontology report also lays out the results of a comparison of antemortem and postmortem evidence, as well as the odonatologist's assessment of the identification [2].

In forensic casework, bite mark analysis is critical for personal identification. Bite marks can be found in a variety of violent crimes, including sexual assaults, killings, child abuse cases, and sporting events. Each person's teeth are unique in terms of arrangement, size, and alignment. Depending on dental arrangement, malocclusion, habits, occupation, tooth fracture, and missing or extra teeth, teeth leave distinctive markings. The distinctiveness of a dentition is utilised to connect a bite mark to a suspect in bite mark identification. In forensic examinations, bite marks are frequently regarded a helpful alternative to fingerprinting and DNA identification [3]. Missing teeth, misshapen teeth, fractures, crowding, diastema, and other unusual dental traits can aid in the comparison of these distinctive qualities. Palatal rugae (Plica palatine) are asymmetrical anatomical folds that run behind the incisive papillae on the anterior portion of the palate. These are believed to become one, and their morphology remains constant throughout life, nevertheless, their size changes as the palate grows and develops. The palatal rugae are surrounded by the cheek, lips, tongue, teeth, and a buccal pad of fat in their anatomical position inside the mouth cavity. All of this provides some protection in the event of a fire or a high-impact trauma. Rugae are among the best-protected, morphologically individualising soft tissue structures in the body, preserved both after death and during life. Several studies have been published that support the use of palatal rugae in individual identification [4].

DNA evidence is now more generally recognised in court system following recent breakthroughs in DNA profiling. The field of forensic odontology has been transformed as a result of this. DNA profiling/DNA fingerprinting has progressed significantly from traditional fingerprinting. With the passage of time, DNA fingerprinting has grown in popularity and acceptance. DNA analysis is likely the most important forensic technology employed in forensics because no one can change their DNA sequence after leaving it at the crime scene, and it is difficult to avoid leaving one's DNA at the crime scene [5]. The STR is the most widely used of the three types of DNA fingerprints: RFLP, VNTR, and STR. VNTR and restriction fragment length polymorphism both necessitate a large amount of DNA, which is often difficult to come by at a forensic scene, and the DNA fragments being studied are frequently too long to amplify through PCR. STR, on the other hand, use short DNA segments that are perfect for PCR, the volume of DNA is increasing exponentially, making it easier to execute assays on small samples of DNA.

CONCLUSION

Furthermore, STR analysis does not necessitate the time-consuming hybridization to a DNA probe that would otherwise be required. Forensic science has made significant progress in using DNA to solve crimes that were previously unsolved.

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Received: 02-May-2022, Manuscript No. DCR-22-17026; **Editor assigned:** 06-May-2022, Pre QC No. DCR-22-17026 (PQ); **Reviewed:** 20-May-2022, QC No. DCR-22-17026; **Revised:** 30-May-2022, Manuscript No. DCR-22-17026 (R); **Published:** 07-Jun-2022, DOI: 10.35248/2161-1122.22.12.578.

Citation: Bisaso H (2022) Forensic Odontology Responsibilities in Victim Identification. J Dentistry. 12:578.

Because DNA is unique to each individual, it is exceedingly unlikely that it will match more than one person on the globe. As a result, DNA evidence is now accepted in courtrooms.

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