

## Forensic Dentistry – Need to Expand the Horizon

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Forensic dentistry is a challenging and emerging branch of dentistry which deals with appropriate handling and examination of dental evidences including the presentation of dental findings in the interest of justice and forensic human identification. Confirmation of deceased identification is important for family, relatives and friends from emotional and grieving aspect but it is also needed for legal purposes including criminal investigations and insurance settlements etc. Because of continued increase in violence and crimes against human life, such as bomb explosions, wars or plane crashes, road traffic accidents, natural disasters as well as cases of carbonized bodies or in advanced stage of decomposition, all these highlight the need to employ ever faster, highly accurate and reliable methods during the process of identification of victims. Also, such circumstances need a method of identification which can be applicable even if the body of victim is destroyed or disfigured.

There are several methods used for individual identification. The most common methods include visual identification by a family member, identification from personal information, and medical information, footprint and fingerprint records of individual and clothing. Personal information includes height, age, body build and hair presence or absence and medical information includes scars, tattoos, birthmarks, implants, amputations and prosthesis of individual.

Various methods used in forensic dentistry include chelioscopy, rugae print identification, facial reconstruction, tongue print identification, denture identification, bite mark analysis and identification from dental record comparison. In some circumstances such as fire explosions, wars or plane crashes, natural disasters, bomb explosions and when body of deceased individual has been decomposed, disfigured or skeletonized with time, then the commonly used identification methods are invalid. In such conditions DNA profiling has become immensely important as the teeth remain preserved even under adverse conditions. Teeth in human body are the most stable and durable and they can withstand heating temperature upto 1600°C without much change in their microstructure. Teeth remain intact long after other tissues and organs of body have been damaged by decay or incineration. Teeth are sealed box like structures which preserve pulp tissue providing good source for isolation of DNA which can be used in DNA profiling identification method. Polymerase chain reaction, Short tandem repeat typing, Restriction Fragment length polymorphism, Single nucleotide polymorphism typing, Analysis of mitochondrial DNA, Analyzing Y chromosome, X chromosome STR typing and Automated STR genotyping are the techniques used for performing DNA profiling.

Teeth can also be used as valuable tool for age estimation of individual, to determine gender and ethnicity and they also provide information about habits and occupation of person.

Although all these methods can be helpful in forensic science investigations, but there are some shortcomings associated with these methods, therefore this should be kept in mind while using these techniques for investigation purposes. So it is necessary to aware the dentists and broaden their knowledge on this theme to make them capable for playing immense role in forensic investigations and interpreting the dental evidences. The dental records play a key role in forensic investigations, so dental professionals should take responsibility to maintain proper dental records of patients which will serve as antemortem data for comparison. Digital form of

data is easy to store, therefore efforts have to be made to computerize all the data available for easy and long term maintainenece to facilitate comparison.

Forensic odontology is an upcoming branch of dentistry with a lot of scope for development. There is need of new researches to be encouraged in the field of forensic dentistry which will pave way for incorporating newer technologies in establishing the human identity. Dental students and dental professionals should be trained for their role. Preclinical lectures and clinical training must be incorporated in undergraduate program along with detailed exposure to forensic cases to enhance their grasp of forensics in order to address medico-legal issue in their future practices. Periodic conferences, seminars, workshops and CDE programs would help the dentists and dental students enrich their knowledge about forensic dentistry.

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