Forensic odontology is a specialized field of dentistry related to legal problems. It is one of the most rapidly developing branches of forensic medicine and forensic science. This branch gives immense importance to dental evidence for the identification of victims and suspects in mass disasters, abuse, and organized crimes. This relatively small specialty within the forensic sciences has been utilized for many years, principally in the area of establishing identity.

Forensic odontology can be defined in many ways. The Federation Dentaire Internationale (FDI) defines forensic odontology 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. According to the American Society of Forensic Odontology, forensic odontology is by definition, the application of dental science to the law, i.e. the use of dental evidence in the interest of justice.

Based on the major fields of activity, Avon classified forensic odontology into civil, criminal, and research. The civil field is concerned with mass disasters such as airline accidents, earthquakes, or train accidents which require identification of the victims in advanced stages of physical destruction. It is also concerned with malpractice and different types of fraud and neglect where damage may be sought. It also deals with the age assessment of individuals such as in cases of teen marriages in the absence of any birth document and in the case of accident victims who are suffering from amnesia who may have to be identified. The criminal field is concerned with the identification of persons from their dental remains alone in cases of homicide, rape or suicide through bitemark analysis, palatal rugoscopy, and cheiloscopy. Finally, the research field is devoted to forensic odontology training for medical and dental professionals.

The use of dental identification appears in scattered instances throughout recorded history and primitive forms of dental identification may have been used in prehistoric times. According to the old testament of the Bible, Adam was convinced by Eve to put a 'bitemark' on the apple. This was the first reported evidence of bitemark in the history of mankind. The late President of Pakistan, General Zia-ul-Haq died in the year 1988 in a plane crash due to an explosion. He was identified from his dentition. The late Indian Prime Minister Mr. Rajiv Gandhi was assassinated in a terrorist attack in 1991 and was also identified from his dentition.

Dental tissue is often preserved indefinitely after death. A complete charting of dentition using FDI system or any other nomenclature should be done. The type of dentition (either permanent or deciduous) and surfaces of teeth involved should be evaluated. Teeth, periodontal tissues and normal anatomical features are assessed in comparative dental identification. Odontograms (symbolic pictorial description of dentition) form a basic outline to compare dental characteristics at the simplest level.

The science of bitemark analysis is a vital area in forensic odontology and has been instrumental in criminal investigations of homicide, sexual assault and abuse cases. The most common method used to document and preserve bite mark evidence is through the use of photography. The bite site should be photographed using conventional photography and following the guidelines described by the ABFO (American Board of Forensic Odontology) bite mark analysis guidelines. ABFO have developed a scale (ABFO scale No.2) to compare bite marks. Bite marks can also be interpreted through soft tissue radiography. This has the advantage of penetrating the tissue, thereby revealing damage that might not be observed in the photographic approach. Xeroradiography, contrast enhanced radiography, and overlays can also add valuable information and should be considered as an adjunct to standard photographic procedures. Human dentition is influenced by genetic factors and environmental factors that determine the position of the teeth in the arch. The dentist in practice observes the individuality of human dentition commonly but there is no database to express quantitatively this uniqueness of human dentition. More research is required to investigate bite mark accuracy and reliability in forensic odontology.

Age assessment using teeth provides the most reliable guide in the process of identification. Various methods are utilized including the visual method, radiographic method, histological method and physical and chemical analysis. Eruption sequence, neonatal line formation, incremental lines of Retzius, Schour and Massler chart...
Thorakkal Shamim

(to estimate dental age in developing dentition) and Gustafson's method are important parameters in age estimation. Gustafson studied the changes occurring in individual teeth and succeeded in estimating age with some accuracy. He used 6 dental changes connected with aging namely, attrition, apical migration of periodontal ligament, deposition of secondary dentin, cemental opposition, root resorption and transparency of the root dentin.

Forensic odontology embraces all dental specialities. Hence, it is almost impossible to segregate this branch from other dental specialities. Appreciation of the forensic field should give the dental clinician another reason to maintain legible and legally acceptable records and assist legal authorities in the identification of victims and suspects. The forensic odontologist should have a broad background knowledge of general dentistry, encompassing all dental specialities and he should have basic knowledge of the role of the forensic pathologist and the methods used in autopsy.6

Unfortunately, in India, probably due to the lack of proper awareness, neither the government nor the people have completely understood the role that can be played by a forensic dentist.

REFERENCES


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