

Editorial

Forensic Pediatric Dentistry

INTRODUCTION

Forensic identification is a multidisciplinary process which involves team work comprising of forensic anthropologist, forensic dentists, law enforcement officials, criminalists, forensic pathologists, and other specialties. In the field of dentistry, each specialization has their unique role to play in forensics. One such important specialization is pediatrics.

PEDODONTIST: WHAT ROLE DO THEY PLAY IN FORENSICS?

Pediatric dentistry is a branch of dentistry which deals with diagnosis and treatment of oral diseases in children. Pedodontist can apply their knowledge and expertise in various fields such as oral trauma, visual, clinical and radiographic interpretation of sound, carious, fractured, restored teeth, eruption and shedding sequence of teeth, oral and maxillofacial syndromes and pathologies, child abuse and neglect, age estimation and identification of individuals with help of tooth structures, bite marks. The dental records maintained by a pedodontist will be very useful in the process of forensic identification.

DENTAL IDENTIFICATION

Human dentition is unique for every individual and its structure and arrangement varies from person to person. It is one of the most indestructible structures and hence used as a positive identification of a person living or dead.

Dental identification can be either, visual, clinical and radiographic interpretation of sound and carious teeth, eruption sequence, shedding sequence, tooth calcification and maturation, trauma to the tooth, root canal treatment, dental restorations, dental crowns and bridges, orthodontic appliances, oral and maxillofacial pathologies.

Sex determination using dental index (mandibular canine index) has shown 86% success rate in individual sex determination.

Dental DNA can also be a great source of identification. Unlike finger prints, where any scars on fingers can alter their presentation, DNA has highest likelihood of survival for a long period; hence, it is a useful forensic identification tool.

ROLE OF RADIOLOGY

Radiology is being used extensively for dental identification based on anatomy and maxillofacial skeletal landmarks in antemortem and post-mortem records. Digital radiography has brought a drastic change in forensic victim identification especially when combined with computer based matching software. Digital radiographic system can also be utilised on site which will prevent any damage from transit and also speed up the identification process.

Three dimensional imaging like computed tomography and MRI has innumerable advantage over traditional radiographic technique where internal structures can be visualised without superimposition for image analysis.

3D CT is used for forensic facial reconstruction and micro CT is used to identify weapons from sharp force injury.

Radiographs play a major role in dental maturation assessment and age estimation, where in they are the most frequently done research to find out new techniques and analysis.

AGE ESTIMATION

Pediatric dentistry is best used for age estimation. Estimation with help of skeletal structures such as fontanelles closure, hand wrist radiograph, mandibular structure, or with help of dental structures by various techniques such as Schour and Massler, Demigran, Cameriere, Nollas method.

Neonatal lines, cementum annulations, third molar eruption are also used for age estimation of individuals. Each method has its own advantages and unique statistical techniques for age estimation.

PALATAL RUGAE IDENTIFICATION

Palatal rugae are unique to individuals and they do not undergo any huge change except in length. They also reappear in the same position post any trauma. They resist decomposition to some extent. Palatal rugae patterns can be stored as plaster casts for a very long time.

CHEILOSCOPY

Study of lip prints is termed as Chelioscopy. Lip prints are said to be permanent and unchangeable. They appear at 6th week of intrauterine life. Changes can occur in lip prints in case of trauma or surgery. They can be an important part of evidence. Changes can occur in lip prints based on the surface, pressure applied and direction.

BITE MARKS

Bite mark is a mark caused by teeth either alone or in combination with other counterparts. Bite marks can be found on injured tissue or inanimate objects like food. As a pattern of tooth arrangement is unique for individuals, bite marks can be used to identify the individual. Bite marks can be found in case of child abuse, violent fights, or sexual assault. A deciduous dentition bite mark will appear as two bow like arches opposing each other with a gap in between. Bite marks can be recorded by photographs, impressions and swabs. Pedodontists play a significant role on documenting bite marks for future investigation. Bite mark analysis can be done manually with help of plaster casts or photographs or can be compared through computer based software.

CHILD ABUSE

Pedodontist play a major role in identifying child abuse either in the form of traumatic injury to the tooth, bite marks, tissue hemorrhages, and lacerations. Any suspicion of child abuse must be reported to particular authorities.

CONCLUSION

From individual identification to child abuse, there is a special role played by a pedodontist in the field of forensics. It is very important to store documented dental records which can be used as evidence for civil and criminal proceedings. Hope this editorial brings in brief the role played by a pedodontist in forensics. Dental professionals are obliged to safeguard rights and protection of children in forensic investigation in terms of age estimation, identification, and abuse pertaining to dental specialty. As criminology and law enforcement are advancing in pace to keep up with the ever increasing crime rate, forensic odontology has emerged as a specialisation in investigation. It's potential in solving crime must be used for the benefit of mankind.

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