



## The Changing Trend of Forensic Odontology in India- A Review Article

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### ABSTRACT

*The importance of dental identification is on the increase year after year. The concept of using dental evidence in forensic investigation has kindled so much interest in the recent past that forensic odontology is even suggested as the single positive identification method to solve certain forensic cases.*

*The most commonest role of the forensic dentist is to identify the deceased individuals.*

*Dental identifications have always played a key role in natural and manmade disaster situations, and in particular, the mass casualties normally associated with aviation disasters. Under these conditions, the bodies of the victims become mutilated to a level that it cannot be recognized & where the dental surgeons plays an important role in the identification.*

*Because of the lack of a comprehensive fingerprint data, dental identification plays an important role in the world. The aim of this article was to emphasis the changing trend of forensic odontology in upcoming years and its role in day to day clinical diagnosis.*

**Keywords:-** Forensic odontology, limitations, knowledge, changing trend.

### INTRODUCTION

The term. forensic.implies “court of law”. Forensic odontology can be defined 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.

Irrespective of the age, the word “forensic” alerts the individuals who listen to it, especially when it is joined with specialties like medical or dental. The professionals keenly interested to know more

& more about it. As we are aware, that the internet has made the world smaller in terms of access and very vast in terms of source of knowledge that it can give for the person who is interested to learn more and who wants to contribute for a better world.

This is an challenging, adventurous & interesting field & interest in forensic odontology has been steadily rising over the past decade or so.

The demand for skilled forensic experts is rising at both the macro and micro levels. Forensic

science involves the technologies from other fields and applied them for criminal investigations. Forensic odontology is a major branch of forensic because teeth are the hardest tissues in the human body and therefore their characteristics remain unchanged even after long periods of stay in extreme environments: the teeth can often survive long periods of fire exposure, burial under soil, drowned under water, in the natural environment. Hence the importance of dental identification is on rise every year. <sup>[1]</sup>.

Forensic dentistry, from its earliest conception, is more or less an off shoot of forensic medicine, the dental surgeon are usually being consulted only in cases where dental data and details are well known to them. As the time passes, the role of dentistry has increased as very often teeth and dental restorations are the only means of identification, especially after accidents, destructive disasters, where the facial configuration and fingerprints are entirely lost.

The various methods employed in forensic odontology include radiographs, tooth prints, cheiloscropy, rugoscropy, bite marks, photographic study, and molecular methods. Though the shortcomings with these various methods are less but the discrepancies related with them are to be weighed cautiously to make forensic odontology a more reliable and reproducible investigatory science.

Teeth, jaw bone, salivary remnants, elements from oral tissues and tissue fluids, presence of foreign bodies, sinus configuration, skull sutures, dental chart comparisons, dental treatment comparison, and DNA analysis all provide an enormous wealth

of identification characteristics and knowledge. Hence, this science is very much valid and it must be given the impetus it greatly deserves for its development in India.

### EARLIER SCENARIO

There has been a great need for forensic experts over the last decades due to the unprecedented demand from the criminal justice system<sup>[2,3]</sup>. However, in India, use of forensic odontology in the criminal justice system is minimal.

There are presently no recognized degree courses in forensic odontology. Very few available odontologists in India are trained and qualified from outside the countries & their qualifications are recognized only recently by the government of India. Practically speaking, the law enforcement authorities and judiciary takes the advice and help of the dental surgeons, posted at government hospitals or government medical/dental colleges regardless of their specialty having no specific training in the field of forensic odontology.

Mainly due to lack of trained personnel, this field is not fully developed in India also there is lack of training facilities, restricted knowledge & limited exposure to the subject and on individual system. From AD 66 till date, dental identification has proved vital in identifying lost individuals, & the 1<sup>st</sup> case was being accepted by the law in the year 1849.<sup>[4]</sup>

Recently, forensic odontology has evolved as a new ray of hope in assisting the field of forensic medicine, but, this such a vital field of forensic medicine is still existing as an infant in India. There are limited institutions offering formal

training in forensic odontology, with shortage of opportunities in job for qualified forensic odontologists who have obtained degrees abroad.<sup>[5]</sup>

### CHANGING TREND

Interest in forensic odontology has been steadily rising over the past decade. The year 2000 was fantastic for India, when the Indian Association of Forensic Odontology (IAFO) was formed by a small group of dentists. The IAFO was registered in year 2001 in Chennai, and the yearly national conferences were been organized from 2002. It has gathered over 100 life members today, having numerous dental specialties as well as private practitioners representing all corners of India.

Concurrently, a new breed of qualified forensic dentists returned back to serve the country, after having undertaken their postgraduation in foreign countries. Among them some have managed to set up unique departments of forensic odontology in different parts of India.

The inclusion of forensic odontology in the revised BDS curriculum in 2007 is also a benchmark, allowing the exposure towards the subject at an undergraduate level.

Its inclusion as detailed chapters in so many textbooks, specially being Shafer's Textbook of Oral Pathology, has confirmed that an overall view of the subject is easily accessible to all dental students. The official publication of the IAFO—is also an integral and important component for increasing awareness of the specialty and encouraging research in it.

The dedicated & sustained efforts of the members of IAFO and their associates, with the help of good publications like journals, seminars, workshops, and conferences held in the last 10–12 years have helped forensic dentistry see good light and also have stimulated more and more dental professionals to pursue their quest for knowledge in the field of forensic dentistry.

Such dissemination of information and scholarly activity among dental students and dentists is vital for the subject's growth and development—after all, it is dentists who can be expected to take the specialty forward.

Extensive interactions with the law enforcers (police), the judiciary (the judges) and the forensic fraternity (forensic medicine experts) at various forums, such as conferences, hands-on workshops, continual education programs and have increased the subject's understanding, awareness towards the subject and its importance.

The contribution of the media cannot be lost here—the fourth estate can single-handedly change the perception of the public on many matters; especially when it is concerns with the use of a science that ultimately aids in the preservation of law and order.

With the DCI introducing the study of forensic dentistry at UG level and also recently approving the proposal to start MDS in forensic dentistry, they have brightened the chances for interested dental professionals to enhance their knowledge in the same and contribute to the field both at national as well as international levels.

### WHAT MORE CAN BE DONE?

It is vital that a person interested in forensic odontology be properly trained and well educated [6,7]

The DCI should make it mandatory for all dental colleges and dental clinics to maintain and preserve the records of patients & should be updated periodically. The students should be trained from UG level itself in this regard. They should be encouraged to participate in forensic debate and discussions and familiarize with different software used globally for the process of identification, age estimations, sex determinations, etc.

There should be phases for the various steps to be taken in this field:-

In the first phase, the undergraduate program must be improved by including preclinical lectures on forensic odontology, which should be followed by clinical training. Exposure to forensic cases, training in forensic medicine and other branches should be ensured by detailed programs.

In the second phase, a structured postgraduate training program should be developed, with significant clinical exposure to different fields, especially microbiology & oral pathology .adequate training for the postgraduate trainee must develop along with proper report presentation to the police department, criminology, record keeping , legal jurisprudence, forensic photography & use of computers.

For the third phase, it is recommended that postgraduate diploma course/certificate course/short-term courses be started in the specialty of forensic dentistry.

As forensic odontology includes many dental specialties, each specialty can contribute lectures in different topics till qualified forensic odontologists are available in this country.

Also other universities under the faculty of science can start bachelor or master degree programs in forensic dental science, and those who finish such courses may assist the law enforcing authorities in the identification of victims in mass disasters, determination of the sex of unidentified individuals, age estimation etc.

Establishment of referral centers with well-equipped dental labs (at least at the district levels), standardization of techniques and, most importantly, improvements in record keeping.

### CLINICAL SIGNIFICANCE

The practice of forensic odontology has gained importance in a number of developed countries all around the world, but as far as developing countries like India is concerned it is yet to gain full attention. In 2004 the death rate in India due to the tsunami was more than 15,000 [8] but the question that all were identified remained still to be answered. This could have been made possible if there were adequate forensic odontologists for identification of the victims.

Though the speed of the earth spinning on its axis (24 h) and its time taken to orbit around the sun have remained constant, however, people living on the earth are moving around more frequently and swiftly, so keeping a tab on them and precisely identifying them has become more important and essential.

Due to ineffective coordination among the various investigating groups, many victims were mass cremated without identification.

Forensic odontology has always played a vital role in identification of persons in mass disasters (aviation, earthquakes, Tsunamis), in crime investigation, in ethnic studies, and in identification of decomposed and disfigured bodies like that of drowned persons, pre victims, and victims of motor vehicle accidents.

Apart from mass disasters, carnal and heinous acts culminating in homicide of victims particularly children are also common. In all these, it is the duty of the state to accomplish the social obligation of recovering, identifying, and giving the remains of the deceased to the relatives. It is also imperative to identify the cause and time of death for insurance claims, testament, business and commerce, marriage, and other situations that require legal designation of the death.

With the change in lifestyle of these people, it has become even more challenging to collect and assimilate the data of each individual in the diverse societies of every country. The latest technology should be put to best use in compiling and retrieving the data of individuals both at national and international levels

So, it is very crucial that the professionals and members concerned with forensic science are sufficiently trained at an international level to positively and accurately identify the individual who has gone missing or is lost or deceased or victimized.

With more than 40,000 dead bodies going without identification in our country annually, it is very

important that forensic odontologists find best ways and means to help in identifying the deceased accurately and also economically, since DNA profiling is more expensive and at times not practical

The most encouraging and satisfying observation is that dental identification is looked upon today as a reliable methodology which is highly accurate when used correctly in identifying the individual concerned. This fact also is helping in motivating the young and senior dental professionals to take up more research work in this field.

The applications include identification and age estimation of living or deceased individuals from their jaws, facial bones, teeth; analysis of bite marks to identify perpetrators; victims of violent and sexual attacks; cases of family violence (marital, child and elderly abuse and neglect);

Beginning with the first case and for every case after, always remember these words from Mark Twain: "If it is a Miracle, any sort of evidence will answer, but if it is a Fact, proof is necessary"<sup>[9]</sup>.

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