

## Forensic Odontology with Medico-Legal Aspect from Ashes to Truth

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**How to cite this article:** Niharikaa Awasthy / Forensic Odontology with Medico-Legal Aspect from Ashes to Truth. Indian Journal of Forensic Odontology. 2020;13(2):5 -11

### Abstract

Forensic odontology is a subspecialty of dentistry that has as its principal consciousness on the identity of deceased individuals.

This is usually an only one victim however comparisons between submit mortem findings and antemortem dental records had been shown to be the preeminent technique for identification in mass catastrophe conditions. Forensic odontology brings information of orofacial systems, their variant among people of differing ancestry, and the implications of dental remedy to the identification technique forensic Odontologist can nevertheless make a contribution to the identity research in the absence of dental statistics via profiling the deceased the usage of capabilities associated with tooth. teeth with their physiologic versions, pathos and impact of therapy report records that stays throughout life and past. this newsletter explores an perception to forensic odontology and descriptions some of its medico-legal packages in criminal investigations.

**Keywords:** Bite marks; Forensic odontology; Criminal liability; Malpractice; Ante mortem; Post mortem.

### Introduction

Forensic odontology useful resource the regulation withinside the justice administration. Because of the development withinside the criminal justice gadget, there has been an awesome diffusion in crime research techniques as some distance due to the fact the clinical infusion is involved, as determined withinside the previous decennium. Using system, protocols and strategies in crime detection via police officials, identification of alleged criminals /offenders allows in putting in a important link among the judiciary and police pressure. Further, they take account of these bodily portions of evidence that are steady and decide the accuracy of the innocence or guilt of the crook/ wrongdoer. Forensic odontology offers with right

managing, assessment and exam of the dental proof.

Forensic odontology is a extensive outgrowth of forensic medicinal sciences and, withinside the felicity of justice, pacts with the apt exam, managing and demonstration of dental proof withinside the courtroom docket of regulation. It plays a pivotal role in identifying the human remains of victims, not only those of mutilated, burnt and decomposed but also victims of bioterrorism and mass disasters<sup>1</sup>

#### *Importance of Forensic Science in Law*

The utility of technology to the ones criminal and civil legal guidelines which can be enforced with the aid of using the police businesses in a criminal justice system. Forensic Science offers with the utility of the expertise and method of numerous disciplines of technology to felony matters.

Forensic Science is capable of achieve this as it has advanced to function in the truth decided with the aid of using the Criminal Justice System<sup>1</sup> Changes which can be taking place these days appear to

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disillusioned the connection among Forensic Sciences and the Criminal Justice System with the aid of using the advent of communicate problems. Forensic professionals hire strategies and numerous equipment to interpret crime scene proof and use that treasured statistics in investigations<sup>2</sup>

### *The Scope of Forensic Science*

*Forensic Odontologists Are The Candour Delver's.it's Our Privilege And Frieght- Dr.Niharikaa Awasthy*

Forensic Biology/DNA: Apart from fingerprint analysis, DNA profiling is the alternative generally used forensic method in criminal investigations<sup>3</sup>. The organic proof maximum generally used for DNA profiling consist of blood, saliva, semen, skin, urine, and hair. However, DNA fingerprints are commonly in no way used because the unmarried piece of proof withinside the courtroom docket of law<sup>4</sup>

### *Forensic Odontology*

Forensic odontology enables withinside the identity of sufferers while the frame is left in an unrecognizable state<sup>5</sup> Forensic dentists or odontologists resource withinside the comparative identity of someone with the aid of using inspecting the improvement and anatomy of the enamel inclusive of any restorative dental corrections along with filling<sup>6</sup>. It is frequently carried out to criminal investigations for bite mark analysis<sup>6,7</sup>

### *Objective*

- To verify the significance of forensic odontology withinside the area of law.
- To verify the issues & issues of admissibility of numerous forms of forensic proof withinside the Legal Regime<sup>8</sup>

### *Forensic Odontology*

Forensic odontology is that department of dentistry endeavors to understand the unknown victims of crime. It additionally accord to the detection of crime and moot the ones accountable to justice.

Dentists have performed a important position in bringing unsolved investigations to a high-quality surmise<sup>9</sup>

Forensic odontology has additionally performed a position withinside the identity of numerous fatalities from disasters along with tsunamis, earthquakes ,mass atrocities and street accidents. The collation of ante-mortem and autopsy dental facts for unidentified sufferers remains one of the first-class and maximum often used strategies of

identification<sup>10</sup>.

Forensic odontology is a forte in Dentistry, which occupies a number one area of interest with withinside the overall spectrum of strategies carried out to medico criminal identification<sup>11</sup> The forte of forensic odontology is carried out in radiographic research, human chunk marks analysis, anthropologic exam and at some point of mass disasters<sup>12</sup>

Besides the reality that radiographs require pretentious laboratory, it's far nonetheless claimed to be a facile, rapid, non-invasive approach of age identity withinside the deceased<sup>13</sup>

The budding DNA era has conquered the conventional strategies and presently being pondered as leader investigating device in revealing the hidden mysteries of sufferers and suspects, particularly in hopeless circumstances<sup>14</sup> Forensic odontology has performed a primary position in fixing austere instances and proved to be sturdy proof withinside the courtroom docket of law<sup>15</sup>

Systematic series of dental facts and protection of the equal could marshal the felony officers in identity of the deceased<sup>16</sup> To serve the forensic operation and felony government, dental experts want to be acquainted with the fundamentals of forensic odontology, which could create a attention to hold the dental data<sup>17</sup>.

The goal of this paper is to emphasise the essential programs of forensic odontology in medico-legal issues<sup>18</sup>

The roles of any professional in forensic dentistry are to collect, hold and interpret hint proof, then to relay the outcomes to the judicial authority. Those features require sound expertise in coping with crime scenes research and enough acquaintance in law<sup>19</sup>.The use of enamel as proof isn't always recent.

*Forensic odontology has primary regions of usage as follows:*

1. Diagnostic and healing exam and assessment of accidents to jaws, enamel, and oral soft tissues<sup>20</sup>
2. Identification, exam, and assessment of chunk marks which arise with a few frequency in sexual assaults, toddler abuse instances, and in private protection situations<sup>21</sup>.

### *Insight about teeth*

Every human body ages in a simple manner, the teeth observe a particular pattern. These quantitative measurements assist to set up relative age of someone. Dental X-ray is an example

Forensic Dentistry in Mass Disaster Routine identification duties are a easy one-to-one matching process<sup>22</sup> This isn't always accomplish capin a position in case of failures. The identification of deceased sufferers in the ones instances necessitates setting a entire listing of facts which includes an ante mortem and info of postmortem dental statistics<sup>23</sup>

Forensic Odontologist has contributed to the answer of many mass disasters. Forensic odontologists contributed to the identity of the ultimate 1/2 of with the aid of using helping the fingerprint, DNA and bodily traits teams<sup>24,25</sup>. Weak or even absence of dental facts did now no longer forestall Forensic Odontologists from contributing to the identity of tsunami sufferers in Thailand<sup>26</sup>.

Victims and not using a dental facts had been both recognized with the aid of using photographic superimposition, if a image displaying top anterior enamel became provided, or with the aid of using narrowing down feasible fits for the DNA and fingerprint groups via dental aging<sup>27</sup>

#### *Bite Mark Analysis*

Bite marks are as compared to recognised enamel molds to locate foundation of bite accidents.

Bite mark over cheek Injuries caused with the aid of using enamel and left on objects, along with skin, have a one of a kind pattern. Those patterned accidents (bite marks) are beneficial to judicial government due to the fact they assist in reconstructing beyond activities that surrounded the biting process<sup>28</sup>. For example, bite marks imply a violent interplay among the offender and the sufferer, and they may inform us something approximately the criminal intentions of the offender, whether or not sexual, toddler abuse, or different kinds of assaults<sup>29</sup>

## **Methods**

### Facial Reconstruction

Faces are odd to each man or women born on this global from the beyond. Face is vital for human identification and is a boon to the humankind<sup>30</sup> It performs a first-rate position in forensic sciences due to the reality that if the face of the deceased character stays unchanged, the identification of the character may be without problems made with none want for forensic experts. Forensic dentistry features handiest in instances wherein the face of the character is destroyed with the aid of using a few means<sup>31</sup>.

Forensic experts paintings for figuring out the

recovered human stays (identity of complete or fragmented our bodies). Most frequently in primary disasters and in accidents, the frame of the lifeless character can be decomposed or skeletonized<sup>32</sup>

#### *Denture Identification Methods*

Victims owning all or maximum in their dentition may be recognized the usage of their enamel via numerous strategies, while the ones lacking all in their enamel lack such statistics. In such instances, the handiest identifiable stays are the sufferer's dentures<sup>33</sup>

A denture as such with none markings is of much less or no need in forensic dentistry. The dentures can display the fantastic identification of someone, handiest if it's far marked<sup>34</sup>

#### *Tongue Prints*

Tongue is particular to all of us in its form and floor textures and is the handiest inner organ that may be protruded from the frame and without problems uncovered for inspection. Use of tongue prints for forensic identity is at budding degree now.

For this method to be successful, the antemortem image or influence of the tongue is available<sup>35</sup>

#### *The Medico-legal Cases*

##### *First Documented Case of Forensic Odontology – 49 A.D*

The identity of Lollia Paulina, withinside the yr49 A.D, is idea to be the primary

mentioned case of forensic odontology. In order to preserve her private affect on the Roman Imperial Court, Agrippina, the spouse of the Roman Emperor Claudius, ordered her squaddies to kill Claudius' first spouse, Lollia Paulina. Agrippina advised the squaddies who had been to kill Lollia Paulina, to convey her the sufferer's severed head. Agrippina recognized Paulina's head from the odd functions of her dentition<sup>36</sup>

##### *Famous Chunk Mark Case - Ted Bundy, Serial Killer – 1978*<sup>37</sup>

Ted Bundy became an American serial killer, energetic in 1970's, who became liable for the rape and homicide of greater than thirty younger women. On Jan 15, 1978 the homicide of Lisa Levy and Martha Bowman became mentioned with the aid of using a witness. Both ladies have been savagely attacked and killed. Biological proof amassed from the crime scene proved inconclusive. Lisa Levy have been bitten on her left buttock and breast, which later became out be the vital proof on

this case. Dr. Richard Souviran, Forensic Dentist (Florida) became asked to study the suspect and the to be had proof. Ted Bundy refused to cooperate so courtroom docket permission became acquired to require him to post to

dental exam. The photographs, bite facts and dental impressions which had been later produced allowed

Dr.Souviran to return back to a end that the chunk marks on Lisa Levy's left buttock matched with the impressions acquired from the suspect. Ted Bundy became sentenced to dying and accomplished at Raiford Prison in Starke, Florida, on Jan twenty fourth 1989. The Bundy Case became the primary one mentioned withinside the records of Florida which depended on chunk mark evidence<sup>37</sup>

*Carla Terry Murder – Cold case solved after a decade (1991- 2001)*<sup>38</sup>

On January twenty eighth 1991, Carla Terry's frame became observed in a partially wrapped rubbish bag on an deserted street in Hartford Connecticut. Two outstanding thumb marks had been observed at the sufferer's neck. The investigators agreed that her assassin had pressed the carotid artery and bit her breast till she have become unconscious. Unfortunately a number of the forensic proof became destroyed with the aid of using the paramedics who to begin with attended the scene. The police retrieved a card from Terry's pocket bearing the name, Alfred Swinton, who right away have become a suspect however he case went bloodless because the medical expert couldn't accomplice the bite marks with Swinton. In 1998, the bloodless case became delivered to Dr Gus Karazulas, Chief Forensic Odontologist, Connecticut State Police Forensic Science Lab.

In March 2001, the suspect Alfred Swinton became said responsible and imprisoned for sixty years. He is likewise believed to be liable for seventeen extra killings<sup>38</sup>

*Tia Sharp Murder – 2012*

Tai Sharp, a twelve-yr-antique college female became mentioned lacking from her grandmother's domestic in New Addington, London, in August 2012. After per week of searching, Tia's frame became observed withinside the loft of her grandmother's domestic<sup>39</sup> It have been wrapped in mattress sheets and bin liners. Stuart Hazell, the accomplice of Tia's grandmother, became the last character to be visible with Tia earlier than her disappearance. Using organic proof, acquired from Hazell's belt and different sources, it have become

clean that she have been the sufferer of a violent sexual assault<sup>40</sup> But as her frame became badly decomposed because of the excessive temperature withinside the loft, direct identity became impossible. The schoolgirl's identification became showed with the aid of using her dental facts.

Stuart Hazell became sentenced to existence imprisonment on May 14 2013 for her murder<sup>41</sup>

*Nirbhaya Case: Delhi Gang Rape*

2012 On December 16, 2012 in Delhi, India, Nirbhaya, a twenty-3 years antique woman became the sufferer of a couple of rape while she became a passenger on a non-public bus. She became observed with the aid of using a male friend. Due to the excessive accidents which she obtained withinside the brutal assault, she later died on Dec 29, 2012<sup>42</sup>

The suspects had been traced inside twenty 4 hours. Six guys had been observed responsible inclusive of a juvenile. The severa chunk marks at the sufferer's corpse had been as compared with the dental fashions of the accused. Dr Ashit B Acharya, (Head of forensic

odontology department, Dharwad) analysed the chunk marks with the resource of laptop software program and postulated that of the chunk marks had been same with suspects. The submitted proof became authorized with the aid of using the courtroom docket on May 6th, 2013<sup>43</sup> One of the accused dedicated suicide at some point of his trial and the juvenile became sentenced to a few years imprisonment. The ultimate 4 adults confronted the dying penalty<sup>44</sup>

## Conclusion

You have the Answer. Just get quiet sufficient to pay attention it. Pat Obuchowski.

Forensic odontology is a sub-field of dental technology which lies on the interface of dentistry and the law. Teeth are the maximum long lasting organs withinside the our bodies of vertebrates and might consequently yield essential proof. Dentistry has a lot to make contributions withinside the detection and backbone of crime and in legal proceedings.

Dental identity is primarily based totally on man or woman traits of the dentition. As fantastic popularity of the sufferer or suspect in a crime, can rely upon the supply of ante-mortem dental facts, it's far the precise obligation of dentists to preserve correct facts for his or her sufferers which may later

emerge as essential proof in high-priced coverage claims and maximum importantly, in making sure that justice is completed in courts of law.

## References

1. Forensic Odontology. Faraz Mohammed, Arishiya T. Fairozekhan, Subraya Bhat, Ritesh G. Menezes In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2021 Jan. 2020 Sep 1.
2. "Job Description for Forensic Laboratory Scientists". Crime Scene Investigator EDU. Archived from the original on 6 September 2015. Retrieved 28 August 2015
3. Rod Gehl [pressbooks.bccampus.ca/criminalinvestigation/chapter/chapter-10-forensic-sciences/Forensic Sciences](http://pressbooks.bccampus.ca/criminalinvestigation/chapter/chapter-10-forensic-sciences/Forensic%20Sciences)
4. Harbison S. Forensic body fluid identification: state of the art 10 February 2016 volume 2016:6 Pages 11-23.
5. Soodan K S, Priyadarshni P. Scope and Application of Forensic Dentistry. The International Journal of Science And Technoledge, Vol 2 Issue 5 May, 2014.
6. Verma AK, Kumar S, Rathore S, Pandey A. Role of dental expert in forensic odontology, Natl J Maxillofac Surg. 2014;5:2-5.
7. Ramaswamy C. A Select List of International Cases Involving Forensic Odontology (49 2013 AD)
8. Saranya V, Malathi. N. Forensic Odontology: A Brief Review, srjm, 2014;7:22-28.
9. John Oladapo Obafunwa, Victor Olabode Ogunbanjo, Ogunbiyi Babatunde Ogunbanjo, Sunday Sokunle Soyemi, and Francis Adedayo Faduyile Forensic odontological observations in the victims of DANA air crash Published online 2015 Feb 4. doi: 10.11604/pamj.2015.20.96.5360
10. Luciana C, Isadora AdS and Rafael GL Forensic Dentistry: An Overview of the Human Identification's Techniques of this Dental Specialty. J Forensic Res .2011;5:256.
11. Dr. Kaur G, Chanana S. Forensic Odontology And Its Indian Perspectives, jpmft 2009; 9(1): 0972-5687.
12. Kumar V, Shanbhag L. Significance of Dental Records in Personal Identification in Forensic Sciences. Journal of Forensic Science and Medicine. 2016;2(1).
13. Gambhir R S, Singh G. Knowledge and awareness of forensic odontology among dentists in India: A systematic review, J Forensic Dent Sci. 2016; 8(1): 2-6. [9].
14. Acharya AB. Role of forensic odontology in disaster victim identification in the Indian Context. J Dent Specialities. 2015;3(1):89-91.
15. Spitz WU and Fischer's Medico legal investigation of death: guidelines for the application of pathology of crime investigation, Springfield, Ill: Charles C Thomas; 1993
16. Avon. S L. Forensic Odontology: the roles and responsibilities of the Dentist, Journ. Cana Dent Assoc 2004;70: 453-458.
17. Harvey WB. Identity of teeth and marking of dentures, Brit Dent Jour 1956;121:334
18. Tedeschi. C.G., Eckert W.G., Tedeschi L.G. Forensic Odontology in Forensic Medicine, Vol. II. WB Saunders .Company, Philadelphia, 1977; 1116-1153.
19. Rajan M, Julian R. A new method of marking dentures using microchips, Jour Forensic Odontostomatol. 2002 Jun;20(1):1-5.
20. Marella GL, Rossi P. An approach to identification by means of dental prosthesis in a burnt corpse. Jour Foren Odontostomato 1999;17:16-19
21. Jacob RF, Shalla CL. Postmortem identification of the edentulous deceased: denture tissue surface anatomy. Journ Foren Sci 1987;32:698-702.
22. Muhlemann. H.R., Steiner. E. and Brandestini M., Identification of disaster victims: The Swiss identification system, Journ of Foren Sci 1979; 24: 173-181
23. Vale GL. Identification by dental evidence: basics and beyond, Jour Calif Dent Ass 2004;32(8):665-672
24. DeForest, P. N. Petraco, and L. Koblinsky. (1983). Chemistry and the Challenge of Crime. (S. Gerber (ed.), Chemistry and Crime, pp. 45-63).
25. Fradella H.F., Owen S.S. and Burke T.W. (2007). Building Bridges between Criminal Justice and the Forensic Sciences to Create Forensic Studies Programs. Journal of Criminal Justice Education (Vol. 18, No. 2, July)
26. Garland, N. and G. Stuckey. (2000). Criminal Evidence for the Law Enforcement Officer, fourth edition.
27. Sansare K. Forensic odontology. Historical restorations to changes brought about by environmental perspective. Indian J Dent Res 1995; 6:55 Vij K. 2nd ed. Textbook of Forensic Medicine and Toxicology. Churchill Livingstone, 2002. 71-2.
28. Giannelli, P. (1997). The Abuse of Scientific Evidence in Criminal Cases: The Need for Independent Crime Laboratories. Virginia Journal of Social Policy and the Law (vol. 4, pp. 439-478)
29. Grover, N. (2014). Development of Forensic Science and Criminal Prosecution - India. International Journal of Scientific and Research Publications (Vol. 4, Issue 12).
30. Julian R. and Kelty S. (2012). Forensic Science and Justice: From Crime Scene to Court and Beyond. Current issues in Criminal Justice (Vol. 24 No. 1, July)
31. Klinker M. (2009). Forensic science expertise for international criminal proceedings: an old problem, a new context and a pragmatic resolution. The International Journal of Evidence & Proof (Vol. 13, Pg. 102-129).

32. Lappas, N. (1978). Forensic Science Laboratories in the United States: A Survey. *Journal of Forensic Science Society* (Vol. 18, pp. 171-80)
33. Lambert E., Nerbonne T., Watson P.L., Buss J., Clarke A., Hogan N., Barton S., Lambert J. (2003). The forensic science needs of law enforcement applicants and recruits: a survey of Michigan law enforcement agencies. *Journal of Criminal Justice Education* (Vol. 14 No. 1, Spring).
34. Lindquist, C. (1991). Forensic Science Education and the Role of the Forensic Science Educator. *Proceedings of the Taipei Symposium on Forensic Sciences* (Vol. Liu and Chen (edn.), pp. 79-85)
35. Lindquist (1994). Criminalistics in the Curriculum: Some Views From the Forensic Science Community. *Journal of Criminal justice Education* (Vol. 5, pp. 59-68)
36. Lindquist (1995). Criminalistics Education and the Role of the Criminalistics Educator. *Forensic Science Review* (Vol. 7, pp. 61-75)
37. Margot P., (2011). Forensic Science on Trial-What Is the Law of the Land? *Australia J. Forensic sci.* (Vol. 43, pp. 89, 92)
38. Steadman, G. (2000). Survey of DNA Crime Laboratories, 1998. Bureau of Justice Statistics (Special Report No. NCJ 179104).
39. Ramasamy chidambara. A Select List of International Cases Involving Forensic Odontology (49-2013 AD)
40. Ted Bundy. The final bite mark <https://sites.google.com/site/tedbundythelastbitemark/evidence>
41. Murder of Tia Sharp. [http://en.wikipedia.org/wiki/Murder\\_of\\_Tia\\_Sharp](http://en.wikipedia.org/wiki/Murder_of_Tia_Sharp). Connecticut police department. Forensic science lab. 39
42. Four convicted in Delhi gang-rape case. [http://article.wn.com/view/2013/09/11/4\\_convicted\\_in\\_Delhi\\_gangrape\\_case/#/related\\_news](http://article.wn.com/view/2013/09/11/4_convicted_in_Delhi_gangrape_case/#/related_news) (last checked January 11, 2014)
43. Tia sharp ;attest.body was identified by dental records because of decomposition. <http://www.dailymail.co.uk/news/article-2189195/Tia-Sharp-latest-Body-identified-by-dental-records-because-of-decomposition>. <http://www.dailymail.co.uk/news/article/-21899195/Tia-Sharp-latest-body-identified-dental-records-decomposition.html>
44. Delhi gang rape: chronology of events. thehindu(New Delhi) <http://www.thehindu.com/news/national/delhi-gang-rape-chronology-of-events/article5079321.ece>
45. Nirbhaya case: Dharwad college helped with forensics. <http://articles.timesofindia.indiatimes.com/2013-09/13/hubli/42040453-nirbhaya-case-delhi-police-analysis>.