



Forensic Odontology: The Expanding Role of Oral Pathologists in Legal Investigations

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ABSTRACT-

Forensic odontology is a multidisciplinary field that intersects dentistry, pathology, and law to aid in legal investigations. Oral pathologists, with their expertise in oral tissues, histopathology, and disease diagnosis, are becoming increasingly vital in forensic odontology. Their contributions include human identification, age estimation, bite mark analysis, and trauma assessment. Additionally, legal recognition of forensic odontology as a specialized branch of dentistry is essential in ensuring standardized expertise and ethical forensic practice. This article explores the expanding role of oral pathologists in forensic odontology, highlights relevant legal precedents proving that dentistry is an integral part of medicine, and advocates for the formal recognition of forensic odontology as a distinct specialty.

Keywords: forensic odontology, oral pathologist, medico-legal, dentistry

Introduction

Forensic odontology plays a pivotal role in medico-legal investigations, offering critical expertise in human identification, age estimation, and bite mark analysis. Traditionally, forensic odontologists have been responsible for these tasks; however, oral pathologists are now recognized for their advanced knowledge in disease pathology, tissue analysis, and forensic histology, which significantly enhances the accuracy and depth of forensic evaluations. Despite its relevance, forensic odontology has yet to be widely established as a formal postgraduate specialty in many countries. In India, the absence of structured postgraduate training limits the field's progress. Given the increasing complexity of forensic casework, incorporating oral pathologists into forensic odontology will improve legal investigations and forensic accuracy.

The Role of Oral Pathologists in Forensic Odontology

Oral pathologists bring unique expertise in forensic investigations, particularly in human identification and forensic histopathology. Their role in comparative dental analysis includes analyzing ante-mortem and post-mortem dental records, restorations, caries, and anatomical variations. Additionally, their specialization in histological examination allows them to extract and analyze DNA from teeth and jawbones, making them invaluable in cases of human identification.^{1,2}

Age estimation is another crucial area where oral pathologists contribute significantly. Through histological techniques such as cementum annulation and dentin translucency analysis, they provide precise age determination. Moreover, their assessment of dental development in sub-adults helps in estimating chronological age with a high degree of accuracy.³

In forensic bite mark analysis, oral pathologists apply histopathological evaluation to assess tissue reactions and healing stages. Their ability to distinguish bite marks from other injuries or pathological conditions prevents wrongful accusations and ensures accurate forensic testimony.⁴ Additionally, their expertise in identifying systemic disease indicators and interpreting peri-mortem and post-mortem changes aids in reconstructing crime scenes and determining timelines of injuries.⁵

Legal Recognition of Forensic Odontology as a Specialized Discipline

The legal recognition of forensic odontology is crucial in ensuring expertise-driven forensic investigations. Various judicial precedents have affirmed that dentistry is an integral part of medical sciences, making forensic odontology a legally recognized forensic discipline. The Madras High Court Judgment (2023) established that Bachelor of Dental Surgery (BDS) is part of modern scientific medicine, highlighting the role of dentistry and oral pathologists in medical science. This ruling strengthens the argument that forensic odontology should be treated on par with forensic medicine and be granted independent recognition as a postgraduate specialty.⁶

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Additionally, the National Medical Commission (NMC) Teachers' Guidelines acknowledged the interdisciplinary nature of dentistry and in turn forensic odontology, further advocating its inclusion as a vital forensic specialty. These guidelines stress the importance of qualified forensic odontologists in medical education and forensic investigations, reinforcing the need for structured training and regulation.⁷

In criminal investigations, bite mark analysis has been widely accepted as forensic evidence in courts. However, forensic dental evidence must be handled according to a proper chain of custody to ensure its admissibility in legal proceedings.⁸ Despite its importance, forensic odontology lacks structured postgraduate programs in many countries. In India, the Dental Council has yet to establish forensic odontology as a separate specialty. Recognizing forensic odontology as the 10th postgraduate specialty will bridge the expertise gap and ensure high-quality forensic investigations.⁹

Forensic Odontology as an Essential Part of the Medico-Legal System

Oral pathologists have a significant medico-legal responsibility, often serving as expert witnesses in court, providing testimony on dental evidence, bite marks, and trauma. Legal frameworks such as the Consumer Protection Act, 2019, and The Clinical Establishments Act, 2010, hold dental professionals accountable for forensic analysis. Proper documentation and retention of dental records are also legally mandated to support legal proceedings.¹⁰

Forensic odontology is further supported by specific laws in India, including the Bhartiya Sakshya Adhinyam (BSA), 2023, which replaced the Indian Evidence Act of 1872. This law plays a crucial role in ensuring the admissibility of forensic dental evidence in courts, reinforcing the scientific credibility of forensic odontology. Under this act, dental evidence, including bite marks and dental records, is considered valid forensic proof in criminal cases, highlighting the necessity of qualified forensic odontologists in legal proceedings.¹¹

Additionally, forensic odontology is recognized under the Bhartiya Nararik Suraksha Sanhita (BNSS), 2023 which replaced the code of Criminal Procedure (CrPC), 1973 which allows forensic experts, including forensic odontologists, to provide expert testimony in court cases. This provision ensures that forensic dental reports and analyses are legally admissible, further strengthening the field's credibility.¹²

Furthermore, forensic odontology as a recognized specialty will ensure that forensic investigations maintain the highest standards of accuracy and ethical integrity. Countries like the UK, Australia, Belgium have already established forensic odontology as a distinct specialty. India must follow suit to ensure globally recognized expertise. Collaboration between forensic odontologists, oral pathologists, and legal authorities will significantly improve forensic investigations and judicial outcomes.¹³

Conclusion

Oral pathologists are indispensable to forensic odontology, offering unparalleled expertise in dental histopathology, age estimation, and trauma analysis. Legal recognition of forensic odontology as a distinct specialty will ensure that forensic investigations are conducted with the highest standards of accuracy and ethical integrity. Establishing structured postgraduate programs and integrating forensic odontology into the medico-legal system will pave the way for a more robust forensic practice.

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