OPEN ACCESS Freely available online

Journal of Innovative Dental Sciences

Short Communication

Forensic dentistry- Bite mark analysis

Shreya Sachan*

Dental Graduate, Rama University, Kanpur and the Dental Council of India

DESCRIPTION

Bite mark analysis has traditionally been used in forensic science as a tool for suspect identification, particularly in violent crime investigations. However, its scientific credibility has come under increasing scrutiny in recent years. Several factors contribute to the unreliability of bite mark evidence, including the distortion of skin during and after biting, variations in human dentition, and significant observer bias during analysis. These variables can lead to inconsistencies and misinterpretations, raising concerns about the objectivity and admissibility of such evidence in court. This study critically reviews the foundational issues surrounding bite mark analysis and explores both traditional and modern approaches used in forensic odontology. Traditional methods rely heavily on two-dimensional imaging and manual comparison, which are prone to error and subjectivity. In contrast, advancements in digital technologies such as 3D scanning, computer-assisted overlays, and artificial intelligence offer the potential for more accurate and reproducible assessments. Despite these technological improvements, there is still a lack of standardized protocols and scientific validation, limiting their current forensic application. The study highlights that while bite marks may serve as supportive evidence, they should not be used in isolation to determine guilt or innocence. A multidisciplinary approach that includes DNA analysis and other corroborative forensic techniques is essential. In conclusion, the role of bite mark analysis in forensic investigations remains controversial. Caution must be exercised in its application, and ongoing research, technological development, and methodological standardization are needed to enhance its reliability and ensure justice in forensic practice.

CONCLUSION

In conclusion, bite mark analysis remains a highly debated area within forensic science. While it has historically played a notable role in suspect identification, especially in cases involving violent crimes, the reliability and objectivity of bite mark evidence continue to be questioned. Key issues such as skin elasticity, post-mortem changes, and individual variability in dental anatomy contribute to the challenges of accurate identification. Moreover, human factors like observer bias and subjective interpretation can significantly impact outcomes, raising concerns about the validity of bite mark evidence in legal proceedings. Traditional methods of bite mark comparison, often reliant on 2D photographic analysis and visual matching, have shown limitations in terms of reproducibility and accuracy. Recent advances in digital technology including 3D imaging, computer-assisted overlays, and machine learning algorithms offer promising tools that could improve precision and reduce bias. However, these technologies are still under development and require rigorous validation before they can be fully relied upon in forensic practice. This study underscores that while bite mark evidence can serve as a useful supplementary tool in forensic investigations, it should never be used as the sole basis for conviction. A multidisciplinary approach that includes DNA analysis, witness testimony, and other physical evidence remains essential for ensuring justice. Looking ahead, further research and standardization are critical to improving bite mark analysis. Establishing objective, scientifically sound protocols and integrating emerging digital methods could enhance the credibility of this technique. Until such advancements are fully realized and accepted by the broader forensic community, caution must guide its application in legal contexts. Ultimately, the future of bite mark analysis lies in balancing its potential utility with scientific rigor. Only through ongoing evaluation, transparency, and technological refinement can bite mark identification evolve into a more reliable and ethically sound component of forensic odontology[1-13].

REFERENCES

1. Nikhil Marwah, Textbook of pediatric dentistry.
2. Shobha Tandon, Textbook of pedodontics.
3. B Sivapathasundharam, Shafer's textbook of Oral pathology.
4. Neville ,Oral and maxillofacial pathology.
5. Verma AK, Kumar S, & Bhattacharya S. Identification of a person with the help of bite mark analysis. J Oral Biol Craniofac Res. 2013;3(2):88-91.
6. Clark MA, Sandusky GE, Hawley DA, Pless JE, Fardal PM, Tate LR. Fatal and near-fatal animal bite injuries. J Forensic Sci 1991;36(4):1256-1261.
7. Stavrianos C, Vasiliadis L, Papadopoulos C, Kokkas A, Tatsis D, Samara E. Loss of the ear cartilage from a human bite. Res J Med Sci 2011;5(1):20-24.

***Correspondece to:** Sachan S, Dental Graduate, Rama University, Kanpur and the Dental Council of India, E-Mail: sachan24shreya@gmail.com

Received: May 12, 2025; **Manuscript No:** JDSS-25-1417; **Editor Assigned:** May 15, 2025; **PreQc No:** JDSS-25-1417(PQ); **Reviewed:** May 23, 2025; **Revised:** May 30, 2025; **Manuscript No:** JDSS-25-1417(R); **Published:** June 6, 2025

Citation: Sachan S (2025). Forensic dentistry- Bite mark analysis. J Innov Dent Sci, Vol.1 Iss.1, June (2025), pp:1-2.

8. Verma K, Joshi B, Joshi CH, Reject Paul MP. Bite marks as physical evidence from the crime scene-An overview. Sci Rep 2013;2(1):1-6.
9. Stavrianos C, Vasiliadis L, Papadopoulos C, Pantazis A, Petalotis N, Tatsis D, et.al. A case report of facial bite marks; reference of methods of analysis. Res J Med Sci 2011;5(3): 126-132.
10. Vale GL, Noguchi TT. Anatomical distribution of human bite marks in a series of 67 cases. J Forensic Sci 1983;28(1):61-69.
11. Bhargava K, Bhargava D, Rastogi P, Paul M, Paul R, Jagadeesh HG, et.al. An overview of bite mark analysis. J Indian Acad Forensic Med 2012;34(1):62-66.
12. Chu SJ. Range and mean distribution frequency of individual tooth width of the maxillary anterior dentition. Pract Proced Aesthet Dent 2007;19(4):209-215.
13. Kaur S, Krishan K, Chatterjee PM, Kanchan T. Analysis and identification of bite marks in forensic casework. Oral Health Dent Manag 2013;12(3):127-131.