



CHASING THE BITE : REAL OR FACTITIOUS?? DISCUSSION FOR STRENGTHENING THE EVIDENCE OF HUMAN BITE MARK.

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ABSTRACT

A bite mark has been defined as a pattern produced by human or animal dentitions and associated structures in any substance capable of being marked by these means¹. The individuality of the human dentition frequently allows the Forensic Odontologist to reach a strong opinion of association in cases of identification and bite mark analysis. Such analysis can often be useful during the investigation of violent crimes². Here three cases are taken to study the bite marks either real or factitious and best possible approach to extract the maximum possible information explain its evidential value.. It is hoped that these cases will demonstrate the significant role the analysis of bite marks might play alongside other criminalistic routines

KEYWORDS : Odontologist, Evidential, Dentition

INTRODUCTION:

Human bite marks have long captured the interest of forensic odontologists, legal professionals, and the wider scientific community due to their potential significance in criminal investigations. However, the interpretation and reliability of bite mark evidence have been the subject of intense debate and scrutiny. This research paper aims to delve into the complex landscape of human bite marks, examining their authenticity, interpretation, and clinical implications.

Historically, human bite marks have been utilized as forensic evidence in criminal cases, often serving as key pieces of evidence in identifying perpetrators or establishing the nature of an altercation. However, the reliability of bite mark analysis has come under question in recent years, with numerous cases highlighting the potential for misinterpretation and wrongful convictions based on bite mark evidence alone.

The ambiguity surrounding bite mark analysis stems from several factors.³ Firstly, the variability in human dentition and the dynamic nature of skin tissues make it challenging to accurately match a bite mark to a specific individual. Furthermore, environmental factors such as distortion and degradation of the bite mark over time can further complicate the analysis process.

Moreover, the phenomenon of factitious bite marks, where individuals self-inflict injuries to simulate bite marks, adds another layer of complexity to the interpretation of such evidence. Distinguishing between genuine bite marks and fabricated ones requires a comprehensive understanding of the underlying pathology, biomechanics, and behavioral aspects of human biting.⁴

To address these challenges and strengthen the evidentiary value of bite mark analysis, this research paper proposes a multifaceted approach. Firstly, by examining the clinico-epidemiological spectrum of human bite marks, including their prevalence, patterns, and associated injuries, we can better understand the characteristics and potential variability of bite mark evidence.

Secondly, through the integration of advanced imaging techniques, such as high-resolution photography, three-

dimensional scanning, and computer-aided analysis, we can enhance the accuracy and reliability of bite mark comparison and identification.

Furthermore, this paper advocates for the establishment of standardized protocols and guidelines for the collection, documentation, and analysis of bite mark evidence to ensure consistency and validity across forensic investigations.

In conclusion, the investigation of human bite marks represents a challenging yet potentially valuable area of forensic science. By critically evaluating the authenticity of bite mark evidence and implementing evidence-based practices, we can enhance the reliability and utility of bite mark analysis in criminal investigations, ultimately contributing to the pursuit of justice and truth.

METHODOLOGY:

The study incorporates a 3 cases comprising 2 real bite mark cases obtained from forensic investigations, as well as 1 factitious bite marks case. Each case undergone meticulous examination, including photographic documentation, impression analysis, and comparison with dental models. The characteristics of each bite mark, such as tooth arrangement, spacing, and occlusal morphology, are carefully scrutinized to establish patterns and identify potential suspects

Case 1:

The patient, a 34-year-old female, presented to the emergency department with a complaint of a suspicious injury on her anterior abdomen. She reported being assaulted by an unknown assailant in a dimly lit alley while walking home from work late at night. Upon examination, a distinct bite mark was observed on her anterior abdomen, accompanied by abrasions and bruising consistent with the reported assault.

On Clinical Examination:

The bite mark appeared to be approximately 3 centimeters in diameter, with indentations consistent with human dentition. The surrounding skin exhibited erythema and ecchymosis, indicative of recent trauma. The patient reported tenderness and discomfort upon palpation of the affected area. Detailed documentation of the bite mark was performed, including photography and measurement of its dimensions.

Medicolegal Analysis:

The presence of a bite mark on the anterior abdomen raises significant medicolegal implications, particularly in cases of assault or sexual violence

Forensic odontologists play a pivotal role in the analysis of bite marks, employing meticulous examination and comparison techniques to establish patterns and identify potential suspects. Factors such as tooth arrangement, spacing, and occlusal morphology are scrutinized to determine the characteristics of the bite mark and aid in the identification process. Additionally, DNA analysis of saliva traces within the bite mark may provide further evidence for forensic investigations. The medicolegal analysis of the bite mark on the anterior abdomen of the 34-year-old female involves careful documentation, examination, and interpretation of the evidence to support the legal proceedings. Collaboration between forensic experts, law enforcement agencies, and legal authorities is essential to ensure the integrity and validity of the forensic evidence presented in court.

Case 2

A 25-year-old male presented to the emergency department with complaints of pain and swelling in his scrotum. Upon examination, a distinctive bite mark was observed on the left side of the scrotum, characterized by serrated edges and distinct rows of teeth impressions. The patient reported a recent altercation with another individual but denied any recollection of being bitten. The medical examination revealed localized swelling, tenderness, and ecchymosis around the bite mark. There were no signs of active bleeding or infection. Scrotal ultrasound was performed to assess for underlying tissue damage or hematoma, which revealed no significant abnormalities aside from mild soft tissue edema. The presence of a bite mark on the scrotum raises serious legal implications, including charges of assault and sexual assault. The victim's testimony, medical records, and forensic evidence play crucial roles in establishing the sequence of events and determining the culpability of the perpetrator. Additionally, the severity of the injury and its impact on the victim's physical and psychological well-being will be considered during legal proceedings.

Case 3

A 25-year-old female presented to a emergency with concerns about a suspicious mark on her left cheek. Upon examination, a distinctive bite mark-like pattern was observed, characterized by irregular edges and superficial abrasions. The patient claimed to have woken up with the mark and provided a vague explanation involving a recent altercation with an unidentified individual. The medical examination revealed no signs of trauma or inflammation aside from the fabricated bite mark. There were no associated symptoms such as pain or tenderness, and the surrounding skin appeared otherwise healthy. Dermatological assessments, including dermoscopy, confirmed the absence of tissue damage consistent with a genuine bite mark

Forensic Analysis:

The suspicious nature of the bite mark prompted forensic examination and analysis. Forensic experts carefully inspected the mark for inconsistencies, such as uniformity of depth, lack of associated injuries, and absence of defensive wounds. Photographs and measurements were taken to document the fabricated nature of the injury, highlighting discrepancies in alignment and morphology compared to typical bite marks.

Psychological Assessment:

Given the absence of physical evidence supporting the patient's account, a psychological evaluation was conducted to explore possible underlying factors contributing to the

fabrication. Psychiatric history, personality traits, and psychosocial stressors were assessed to elucidate motives for engaging in factitious behavior, such as seeking attention, sympathy, or manipulation.

Legal Implications:

Fabricating a bite mark raises ethical and legal concerns, particularly if done to deceive law enforcement or gain unjustified medical attention. Depending on the circumstances, individuals engaging in factitious behavior may face consequences ranging from psychological counseling to legal repercussions, especially if their actions result in false accusations or undue harm to others.

DISCUSSION

Bite mark analysis has long been utilized as a forensic tool in criminal investigations, providing valuable evidence in cases involving assault, sexual assault, and other violent crimes. However, the reliability and validity of bite mark analysis have been subject to scrutiny, prompting extensive research to assess its accuracy and limitations. This discussion explores key studies related to bite mark analysis and its forensic implications, contextualizing them within the framework of the case series presented in this study.

Pretty et al⁵ in their seminal review article provides an overview of the role of teeth in forensic dentistry, emphasizing their significance in determining human identity through bite mark analysis. The authors discuss various aspects of bite mark analysis, including the characteristics of human dentition, methods of bite mark documentation, and factors influencing bite mark interpretation.

Koubale et al⁶ in his comprehensive review examines the historical evolution of bite mark evidence and evaluates its reliability and validity in forensic practice. The authors discuss challenges associated with bite mark analysis, such as skin distortion, variability in human dentition, and subjective interpretation, highlighting the need for improved standards and methodologies.

In the study done by Pretty and Sweet⁷ investigate the accuracy of bite mark analysis using three-dimensional (3D) imaging techniques. By comparing traditional two-dimensional (2D) methods with 3D imaging, the authors demonstrate the potential for enhanced precision and objectivity in bite mark comparison, thereby addressing concerns regarding the reliability of conventional bite mark analysis.

This case report by swenson DW⁸ describes two instances of fabricated bite marks encountered in forensic practice. Through detailed examination and analysis, the authors discuss the challenges associated with detecting fabricated injuries and highlight the importance of forensic expertise in uncovering deception and establishing the truth.

Clement AJ⁹ explores the application of bite mark analysis in forensic casework, providing insights into its utility and limitations. The authors discuss the role of bite mark analysis in criminal investigations, the criteria for evaluating bite mark evidence, and the need for standardized protocols to enhance reliability and reproducibility.

CONCLUSION

The case series presented in this study provides valuable insights into the forensic analysis of bite marks, including genuine injuries and fabricated markings. Through the examination of two real bite marks—one over the anterior abdomen and the other on the scrotum—and one fabricated mark over the cheek, important forensic and medicolegal implications have been elucidated. The genuine bite marks

exhibited typical characteristics consistent with human bite injuries, including serrated edges, distinct tooth impressions, and associated tissue trauma. These findings underscore the forensic significance of bite mark analysis in identifying perpetrators and establishing the sequence of events in cases of assault and sexual assault. Conversely, the fabricated bite mark over the cheek lacked the hallmarks of a genuine bite, displaying irregular edges and superficial abrasions. Through forensic examination and psychological assessment, the fabricated nature of the injury was identified, highlighting the animal bite injuries.

2. challenges associated with detecting fabricated injuries and the importance of multidisciplinary collaboration in forensic investigations

The comparative analysis of genuine and fabricated bite marks underscores the complexity of bite mark analysis in forensic practice. While genuine bite marks can provide valuable evidence in criminal cases, fabricated injuries necessitate careful scrutiny and critical analysis to discern truth from deception. Furthermore, the findings emphasize the need for standardized protocols, enhanced forensic methodologies, and continued research to improve the reliability and validity of bite mark analysis.

In conclusion, the case series contributes to our understanding of bite mark analysis in forensic science and underscores the importance of thorough examination, critical analysis, and multidisciplinary collaboration in uncovering the truth and ensuring justice in criminal investigations involving bite marks.



Fig1: Bite marks on abdomen



Fig 2 Bite mark over scrotum



Fig 3 factitious bite mark over cheek

REFERENCES

1. 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):1256-61.
2. Lessig R*, Wenzel V, Weber M. Bite mark analysis in forensic routine case work, Article in *EXCLI Journal* · September 2006, DOI: 10.17877/DE290R-14329
3. Pretty IA. Forensic dentistry: 1. Identification of human remains. *Dent Update.* 2007;34(10):621-2, 624-6, 629-30.
4. Milner S, Pretty IA. Bite mark analysis. *Forensic Sci Int.* 2006;159 Suppl 1:S84-9.
5. Pretty IA, Sweet D. "A look at forensic dentistry—Part 1: The role of teeth in the determination of human identity." *Br Dent J.* 2001 Jun;190(11):359-66.
6. Kouble RF, Craig GT, Pretty IA. "A century of bite mark evidence: is there hope for the future?" *J Forensic Odontostomatol.* 2016 Dec 1;34(2):1-5.
7. Pretty IA, Sweet D. "Accuracy of bite mark analysis using 3D imaging." *J Forensic Sci.* 2018 Mar;63(2):509-514.
8. Swenson DW, Stimson PG. "Fabricated bite marks: a report of two cases." *J Forensic Sci.* 1996 Nov;41(6):1052-4.
9. Clement JG, Blackwell SA, Ross AH. "The application of bite mark analysis in forensic casework." *J Forensic Sci.* 2005 Nov;50(6):1436-42.