



Naif Arab University for Security Sciences

Arab Journal of Forensic Sciences and Forensic Medicine

المجلة العربية لعلوم الأدلة الجنائية والطب الشرعي

<https://journals.nauss.edu.sa/index.php/AJFSFM>الجمعية العربية لعلوم الأدلة الجنائية والطب الشرعي
Arab Society for Forensic Sciences and Forensic Medicine

The Intriguing Art of Bite Mark Tattoos: An Analytical Study of Symbolism and Self-Expression



CrossMark

الفن المثير للاهتمام لوشم آثار العض: دراسة تحليلية للرمزية والتعبير عن الذات

Santhiya Raghavan¹, Dhvani Patel^{2*}¹Postgraduate, Department of Forensic Odontology, School of Medico-Legal Studies, National Forensic Sciences University, Gujarat, India.²Assistant Professor, Department of Forensic Odontology, School of Medico-Legal Studies, National Forensic Sciences University, Gujarat, India.

Received 12 Oct. 2024; Accepted 02 Dec. 2024; Available Online 24 Dec. 2024.

Abstract

Body modification has been a part of human society for thousands of years, and tattoos have become one of the most expensive ways to show personal and social meaning. In this article, bitemark tattoos, a less common but growing trend in body modification, and the cultural meanings of tattoos in different cultures and how they have changed over time as a way of expressing oneself and finding oneself are explored. Bitemark tattoos are given a lot of attention because they have deep symbolic meanings and are often linked to power relations and emotional release. The artistic process behind creating these tattoos is analysed, highlighting the skill involved in translating the organic form of a bite into a stylized tattoo design. Additionally, the forensic significance of bitemark, typically studied in the context of criminal investigations, is discussed concerning this art form. This duality- where bitemark serves both as forensic evidence and a medium of artistic expression- presents a fascinating intersection of law, art, and psychology. This study provides a comprehensive analysis of bitemark tattoos within the broader landscape of tattoo culture and body modification, offering new insights into their symbolic and forensic dimensions.

Keywords: Forensic sciences, bite mark tattoo, self-expression, body art, personal identity, forensic identification.

المستخلص

كان تعديل الجسم جزءًا من المجتمع البشري لآلاف السنين، وأصبحت الوشوم واحدة من أكثر الطرق تكلفةً لإظهار المعنى الشخصي والاجتماعي. في هذه المقالة، يتم استكشاف وشم آثار العض، وهو اتجاه أقل شيوعًا ولكنه متزايد في تعديل الجسم، والمعاني الثقافية للوشم في مختلف الثقافات وكيف تغيرت بمرور الوقت كوسيلة للتعبير عن الذات والعثور على الذات. يحظى وشم آثار العض باهتمام كبير لأنه يحمل معاني رمزية عميقة وغالبًا ما يرتبط بعلاقات القوة والإفراج العاطفي. يتم تحليل العملية الفنية وراء إنشاء هذه الوشوم، مع تسليط الضوء على المهارة المطلوبة في ترجمة الشكل العضوي للعضة إلى تصميم وشم منسق. بالإضافة إلى ذلك، تمت مناقشة الأهمية الجنائية لآثار العض، التي تُدرس عادةً في سياق التحقيقات الجنائية، فيما يتعلق بهذا الفن. هذه الثنائية - حيث تعمل آثار العض كدليل جنائي ووسيلة للتعبير الفني - تقدم تقاطعًا رائعًا بين القانون والفن وعلم النفس. توفر هذه الدراسة تحليلًا شاملاً لوشم آثار العض ضمن المشهد الأوسع لثقافة الوشم وتعديل الجسم، وتقدم رؤى جديدة حول أبعادها الرمزية والجنائية.

الكلمات المفتاحية: علوم الأدلة الجنائية، وشم آثار العض، التعبير عن الذات، فن الجسم، الهوية الشخصية، التعريف الجنائي.



Production and hosting by NAUSS



* Corresponding Author: Dhvani Patel

Email: dhvani.patel@nfsu.ac.indoi: [10.26735/VJME6470](https://doi.org/10.26735/VJME6470)

1. Introduction

Tattooing was a rare practice, something exclusively associated with outcasts and subcultures. Currently, tattoos have become very popular and have been seen as genuine works of beauty in the sphere of artistic expression. It has evolved into decorative art and symbolic depth, representing personal milestones, relationships, and transformative life experiences [2]. Many people view tattoos as a physical embodiment of their identity, with the designs frequently symbolizing significant emotional or psychological experiences [7]. Tattooing has been done for a very long time and in many different cultures, it is often symbolically related to identity, spirituality, and social status. Tattoos in an indigenous society can be very symbolic from the gender and societal perspective, indicating milestones in life. Tattoos were once considered nonconformity emblems, but in recent times, society's opinions have changed, turning them into commonplace manifestations of self-expression and personal identification [15]. For people who are trying to regain control over their bodies after trauma or abuse, tattoos can give them a sense of ownership [4]. In this way, the painful physical problems become emotional release, making healing a personal and spiritual act. People do feel pain during the process, but they also feel more connected to the chosen design. This is permanent proof of a person's power, resilience, and character [5]. Many now treat piercings as fashion accessories while tattoos are ever-growing pieces of personal art. This results in the beauty, fashion, and artistic integrated set of motivations in general [16].

In addition to self-expression, tattoos have also been used for group identification, spiritual protection, and defiance of social standards [5]. As the societal attitude toward body art has been changing,

tattooing has outgrown its age-old norms and incorporated those of all demographics. This is in resonance with the expanding importance of personal narratives and identity in modern culture [13]. The most common reason to get tattoos and piercings is based on the desire to create a uniqueness of individuality. Such a motivation exemplifies a larger cultural movement in which personal expression through body modification is increasingly valued [16].

Innovations, especially in recent years, in machines, inking, and sterilization have made the art of tattooing a distinct work of art in itself. These innovations allow a more complex style, richer colors, and new fashions so that tattoo artists are capable of inventing greater detail compared to before [12]. Additionally, the emergence of social media platforms has been essential in the growth of the tattoo industry, providing artists with a worldwide platform to exhibit their work. The tattoo community now has a wider range of styles and concepts because of this increased visibility, which has encouraged innovation and expanded the meaning of tattoos [13].

Among the many styles that have emerged, bite mark tattoos have gained particular attention. These tattoos, which replicate the appearance of human bite marks, deviate from traditional motifs such as flowers, animals, and abstract designs. Bite mark tattoos challenge conventional beauty standards in tattooing, emphasizing the body as a site of both artistic expression and personal experience [12]. They symbolize an embrace of imperfections, exploring the boundaries between the physical and emotional, and offering a poignant commentary on the human condition.

The rise of bite mark tattoos highlights a growing trend in modern tattoo culture toward designs that carry deeply personal or symbolic meaning. Unlike traditional tattoos, which may focus on aesthetic ap-



peal or abstract symbolism, bite mark tattoos are inherently tied to the raw and unpolished aspects of human experience.

In addition to self-expression, tattoos have also been used for group identification, spiritual protection, and defiance of social standards [5]. As the societal attitude toward body art has been changing, tattooing has outgrown its age-old norms and incorporated those of all demographics. This is in resonance with the expanding importance of personal narratives and identity in modern culture [13]. The most common reason to get tattoos and piercings is based on the desire to create a uniqueness of individuality. Such a motivation exemplifies a larger cultural movement in which personal expression through body modification is increasingly valued [16].

Innovations, especially in recent years, in machines, inking, and sterilization have made the art of tattooing a distinct work of art in itself. These innovations allow a more complex style, richer colors, and new fashions so that tattoo artists are capable of inventing greater detail compared to before [12]. Additionally, the emergence of social media platforms has been essential in the growth of the tattoo industry, providing artists with a worldwide platform to exhibit their work. The tattoo community now has a wider range of styles and concepts because of this increased visibility, which has encouraged innovation and expanded the meaning of tattoos [13].

Among the many styles that have emerged, bite mark tattoos have gained particular attention. These tattoos, which replicate the appearance of human bite marks, deviate from traditional motifs such as flowers, animals, and abstract designs. Bite mark tattoos challenge conventional beauty standards in tattooing, emphasizing the body as a site of both artistic expression and personal experience [12]. They symbolize an embrace of imperfections, exploring the boundaries between the physical and

emotional, and offering a poignant commentary on the human condition.

The rise of bite mark tattoos highlights a growing trend in modern tattoo culture toward designs that carry deeply personal or symbolic meaning. Unlike traditional tattoos, which may focus on aesthetic appeal or abstract symbolism, bite mark tattoos are inherently tied to the raw and unpolished aspects of human experience.

2. Historical context of body modification

Body modification, such as tattooing, piercing, and scarification, is one of the oldest and most common forms of cultural expression that has crossed boundaries to connect civilizations [3]. Tattooing has been around for thousands of years and has been found in countries worldwide, including those in Europe, Asia, Africa, and the Americas [2, 8]. People have used tattoos for many different reasons throughout history. They have been used to show social standing, accomplishments, and acts of defiance against societal norms. They have also been used to record rites of passage [7]. Many ancient cultures gave deeper meanings to tattooing, far beyond aesthetic purposes. Tattoos significantly contributed to ritualistic traditions among many tribal peoples to convey strength, endurance, or survivorship. In some cases, they were a way to show individual identity and shared history. Symbols and stories etched into a person's body connect them to their community [8]. Changes to the body can help a person regain control of their body, especially for women who have been abused. Tattoos and piercings have even more personal meaning when you think that changing your body is seen as a way to heal yourself [5,16].

Body modification, particularly tattoo and piercing, has a history across cultures with significant so-



cial and cultural values. Researching people's reasons for changing their bodies is important because it helps remove the negative stereotypes connected with these changes [16].

From a historical perspective, body modification has been utilized for protection from evil forces. Many old cultures believed in these beliefs, which led to the myth that getting tattoos, piercings, or scars would keep away evil spirits or bring good luck [8]. Some individuals develop a psychological addiction to body modification, interpreting it as a means of preserving personal values and memories [16].

In modern times, body modification, particularly tattooing, has undergone a significant shift [12]. Once primarily associated with marginalized groups, tattoos are now widely embraced across social boundaries. It seems like this change is part of a bigger culture shift in which personal stories, identity, and self-expression are becoming more important [4,7]. Tattoos, which were previously stigmatized, are now celebrated as a means of personal empowerment and artistic expression [7].

As body modification, tattooing, in particular, becomes very normative, the conceptual concerns of tattoo use in forensic science become increasingly complex. Tattoos and other forms of body modification can serve as identifying markers in criminal investigations. Unlike tribal tattoos or scarification practices, most modern tattoos contain personal narratives or emblems of heritage. Tattoos can be a source of powerful symbols of reclamation for survivors of trauma or abuse.

3. Bitemark tattooing

Among all the styles, images, and symbols that a person may elect to attach to their skin permanently exists one extremely amazing theme that increasingly has captured the public's interest because it is unique in itself and of complexity is, the bite

mark tattoo. Bite mark tattoos are quite peculiar, particularly in light of the emotional response they elicit, which has a profound impact on the human psyche. When these marks turn into tattoos, they become permanent reminders and may be made up of several meanings depending on the experiences undergone by the subject. The bite mark tattoo is different compared to other tattoos because of the direct aspect that shows on the skin the actual mark the other person leaves. There is this special way of tattooing by biting into the skin to be able to create a design or pattern, which is then marked by ink or pigment as an exclusive permanent pattern of tattooing. Depending on the desired artistic objective, the impression may be rather shallow or deeper in penetration. This technique is perfect for accomplishing a variety of designs, ranging from delicate and detailed portraits to simple geometric patterns. This creation of a bite mark tattoo involves intricate interaction of several scientific principles and the way the epidermis reacts to the applied pigments; further processes are initiated when a person bites into the skin is an unintentional small wound or tear at the site, disturbing the natural barrier function of the epidermis. This results in better saturation of the skin with the ink or colour, hence a more vivid and well-defined drawing. The biting process could also cause minor tears in the outer layers of the skin. Those tears may provoke an immune response and then inflammation. This inflammation response could distort or alter that original design or image as the body heals. It may lead to scar tissue. This unusual body modification not only deepens understanding of the complex and multi-layered connections between a physical body, self-identity construction, and social perceptions regarding these manifestations, but it also contests traditional ideas of tattooing.



4. Art behind bitemark tattooing

On the superficial level, a bite could be seen as a sign of emotion and desire, aligning with the instinctual and basic features of human relationships and interactions. They speak about their resilience, empowerment, and transformation through getting tattooed with a bite mark. Biting marks on the skin mean that the person who got them had to go through pain to become that person. In this way, the art becomes a way of showing wholeness. This requires careful attention to many details, such as shade, colour, and placement—an absolute must when trying to capture both the bite and the person's unique story [4, 12]. Varied stylistic expressions typify the tattooing of the bite mark. Some individuals are drawn by the very realistic renderings in the detailed effects of skin texture and tone while others like a much more abstract representation. The style often adheres to aesthetic preference, personality, and intrinsic meaning for the tattoo. Thus, common locations will include such areas as the forearm, shoulder, or thigh since these latter areas present a range of possible visibility and personal symbolism. While much of the more traditional blackout nibbles get completed in black ink, actual colour can add full depth and dimensionality to your prints, and skin tones or toned reds can be easily added to give a print a higher degree of realism. This is a task of great accuracy and expertise to make sure that the tattoo when finished is almost a true reproduction of the original bite mark. These tattoos can eventually become such beautiful secret signs of people's relationships, as everything personally shared among them may be represented in those tattoos in ways that go far beyond other expressions.

5. Social perceptions

Cultural interpretations of the tattoo bite mark phenomenon provide some of the richest illus-

trations of the original complexities and the many meanings assigned to them by various cultural groups and individuals. Bite mark tattoos are very popular these days because of the fast growth of social media sites. This is because online, people value being individual and unique [3]. The unique look of tattoo designs appeals to many because they are different from the usual, widely accepted looks. Therefore providing a ground for self-reflection on personal identity [7]. Additionally, it's a great way to show yourself in a way that isn't found anywhere else, especially at a time when people are becoming less different and more similar in every way [4]. However, at the same time, it is very important to recognize that despite all this positive acceptance of tattoos within many environments, negativity toward tattoos still prevails within groups of people. The criticisms that surround tattoos, mainly regarding them as not professional or inappropriate enough, can create fear among individuals and keep others from being open and expressive about their body art [7]. Now that society's norms have changed, the debate over body art can be very open-minded and full of different ideas and interpretations [2]. Because of this, the multi-layered bite mark tattoo, which was so emotionally powerful, would break long-held beliefs that tattoos aren't meant to meet the usual standards of beauty and importance that have been dominating the conversation for a long time. This is especially the case for tattoo marks that show up on a human body to indicate a particular kind of bite mark. People have a lot of different reactions to this, from seeing it as pure creative and personal history for some to something they find strange or upsetting. Bite mark tattoos are a challenge to the idea of what is beautiful and what is aesthetically pleasing. They make a strong statement about individuality and acceptance by using patterns that



look like scars or other flaws on the skin. Instead of conforming to social norms, these tattoos offer a unique perspective on the human body in all its variations. To make tattoos more popular, this culture is probably one clear cause: young people who believe in celebrating and promoting diversity in the tattooing field. Today, the current trend of getting bite marks tattoos has become a very controversial topic, with people arguing loudly about legitimacy, safety, and even ethics. The highest fears associated with tattoos from a person's bites are the infection or transfer of disease from the process of being bitten, as this may expose tissue to the entry of pathogenic bacteria and viruses. The other risk is that of unsensitized and unsafe instruments used in applying tattoos, which may increase the probability of infections and other after-effects [13]. Again, the movement involved in the act of biting itself can be quite damaging to the skin, hence providing a whole range of damaging effects, including scarring, bruising, or even nerve damage in extreme cases. A tattoo bearing the mark of a bite may indicate a penchant for challenging conventional flavours and aesthetics of beauty and social protocol that have traditionally been associated with tattoos. Whereas other people may raise aesthetic designs that make meaning to societal expectations and norms, the tattooed facial bite mark speaks a strong statement of individualism besides consciously rejecting the majority's standards [12].

6. Forensic significance

The science behind tattooing applied in the forensic domain depends basically on absolute familiarity and perfected scientific principles through many years of research and practice. The way tattoo inks react with human tissue makes sure that the marks last a long time. This makes them perfect

for keeping forensic evidence that would be very important in a legal investigation. In this connection, a comprehensive study has been conducted that relates to the chemical constitution of the different tattoo inks and their reaction to the skin tissues to such an extent that further goes to give scientific evidence for their utility in any of the forensic activities [19]. The process involves carefully injecting colours into the top layer of skin. These pigments last for a long time because of the body's complex immune responses to foreign substances.

Traditional methods used to identify bite marks have a lot of complications and issues such as, the skin naturally stretching and healing differently after injury, and there are things in the environment that can damage bites. Indeed, this newly discovered bite mark tattooing presents a novel forensic method for the first time to permanently preserve unique patterns left behind by a bite mark. The evaluation of bite marks has emerged to be an invaluable tool in the domain of forensic odontology, aiding remarkably in the identification of suspects with several criminal activities of violent confrontations or attacks.

This method put the high-end technique next to the bite mark on the body of the victim and the dental print of a suspect, which was mostly used to help prove guilt. There are three stages of the classical framework used in bite mark analysis. These are as follows: The first stage is the thorough recording of the bite mark in question and that of the dental characteristics of the suspect, comparing the dentition with the contours of the bite mark. The last stage lies in the points of congruence or incongruence between the two [6, 14, 18].

From findings published by the National Institute of Standards and Technology (NIST), it is said that bite marks can experience a lot of distortion not



only because of the elasticity of the skin but also because of movements on the part of the victim that can happen in the course of the incident itself [20]. At this point, one of the critical issues with bite mark analysis is that the site of the mark itself needs to be kept open so that it can be used for identification and forensic analysis. The flexibility, elasticity, and reactivity of human skin make it difficult to work with because these things change the skin in ways that hide the real image. Because the skin is an active, stretchy living tissue that heals, swells, and changes shape, all of these things can make a bite mark look very different over time, which can make forensic analysis more difficult.

Bite mark tattooing is a novel technique that provides permanent retention of the imprint of the bite pattern on the skin or any other soft tissue using tattooing methods that result in a long-term record of the characteristics of the bite mark. In most instances, this precise process may be of prime utility during forensic examination if long-term retention and the continued integrity of formed bite marks are of key importance for subsequent investigations. Because tattoos leave behind marks that can't be erased or changed, forensic analysts can do much more thorough and accurate investigations with no possibility of degradation. In addition to this, tattooing a bite mark offers certain forensic advantages in the accuracy and reliability of biting mark identification procedures. This fact influences the tattooing process; because a permanent impression of the bite mark will reduce the complications of the healing of the tissue, as well as environmental degradation that obscures and blurs the marks with time. This lasting permanence allows for the conducting of analyses that are by far more sensitive and dependable, hence contributing to the success of investigations during forensic examinations.

The biggest advantage associated with the application of tattooing in practices involving bite marks is its great ability to prevent the destruction of vital evidence, one of the greatest risks in forensic science. The older forms of bite marks are susceptible to several types of deterioration, such as fading, swelling, or even healing, and thus become unworthy and unworkable for a couple of weeks. Where tattooing techniques are utilized, the process will not be compromised in any way so that the mark of a bite remains stable and unchanged thereby serving as an accurate reference point for any subsequent forensic analysis integral to legal applications. Furthermore, the use of bite mark tattooing may significantly enhance inter-examiner reliability—an aspect that is crucial to the field of forensic science consistency in interpretation is paramount. This method impacts the minimization of the subjective and variable nature of one which is very often encountered when one studies the oft-changing or healing bite marks, and which is critical in getting accuracy in forensic conclusions by creating a permanent and uniform reference through tattooed bite marks. Increased constancy not only enhances the reliability of forensic analyses but also reduces significantly the chances of errors that could negatively affect judicial outcomes.

7. Conclusion

More than almost anything, bite mark tattoos reveal much in terms of meaning and emotion. People who want to celebrate their experiences are wearing them more and more, and they will continue to amaze people who see them. Because of the way people naturally act and the way art can define a person's biography, these tattoos show how the link between body and experience shapes our identity. As new types of body art come out and become



more socially acceptable, bite mark tattoos become a more fluid way for people to narrate the people's personal and express themselves artistically. From their historical roots to their modern meaning, these bite mark tattoos show how art can grow by honouring the human spirit and the stories that are etched on our skin. They are also a personal and expressive way to remember some of the most important relationships and moments of life. Bite mark tattoos are one way of inventing artwork with an individual's use of teeth to create designs on the skin. However, along with gaining attention come controversies. Infections, scarring, nerve damage, and allergic reactions are all several potential dangers one should consider. Safety and hygiene are the bottom line in not wanting such risks to happen. This technique introduces a new approach in forensic technology to overcome the problems that exist with the traditional analysis of bite marks. Besides this, as it records eternal and truthful patterns of bites, it lends reliability to forensic investigations. Though ethical and legal concerns necessitate sound scrutiny, the potential future for bite mark tattooing within the scope of forensic odontology seems bright. Bite-mark Tattoos will play a significant role in forensic applications, for the identification of human remains to use as evidence in court.

Conflict of interest

The authors declare no conflicts of interest.

Source of funding

The authors received no financial support for the research, authorship or publication of this paper.

References

1. Dr. Suman B, Anujna BM, Dr. Nusrath Fareed, Dr. Medha Babashet, Dr. Srikanth H Srivathsa. Credibility of bite mark analysis in forensic odontology: A diagnostic accuracy trail. *Int J Forensic Med* 2024;6(1):18-25. DOI: 10.33545/27074447.2024.v6.i1a.71
2. Burchak I.N., Vorobchuk M.S., Puz' A.D. Tattoo drawings as an artistic heritage of society: history and modernity. *Theory and Practice of Design. Sciences. Works. Culture and art*. 2023. Issue. 29–30. pp. 139–145. doi: <https://doi.org/10.32782/2415-8151.2023.29-30.16>
3. Lim, W. M., Ting, D. H., Leo, E., & Jayanthi, C. (2013). Contemporary Perceptions of Body Modifications and Its Acceptability in the Asian Society: A Case of Tattoos and Body Piercings. *Asian Social Science*, 9(10). doi:10.5539/ass.v9n10p37
4. Kierstein, L., & Kjelskau, K. C. (n.d.). Tattoo as Art, the Drivers Behind the Fascination and the Decision to Become Tattooed. *Current Problems in Dermatology*, 37–40. doi:10.1159/000369180
5. Simone Alter-Muri (2019): The Body as Canvas: Motivations, Meanings, and Therapeutic Implications of Tattoos, *Art Therapy*, DOI: 10.1080/07421656.2019.1679545
6. Giannelli, Paul C., "Bite Mark Analysis" (2007). Faculty Publications. 153. https://scholarlycommons.law.case.edu/faculty_publications/153
7. Ferreira, V. S. (2011). Becoming a Heavily Tattooed Young Body. *Youth & Society*, 46(3), 303–337. doi:10.1177/0044118x11427839
8. FISHER, J. A. (2002). Tattooing the Body, Marking Culture. *Body & Society*, 8(4), 91-107. <https://doi.org/10.1177/1357034X02008004005>
9. Anthony Cardoza (2023) Forensic Odontology and Bite Mark Analysis: Understanding the Debate, *Journal of the California Dental Association*, 51:1, 2210332, DOI: 10.1080/19424396.2023.2210332
10. Malik SD, Pillai JP, Malik U. Forensic genetics: Scope and application from forensic odontology perspective. *J Oral Maxillofac Pathol* 2022;26:55863.
11. Kang, M., & Jones, K. (2007). Why do People get Tattoos? *Contexts*, 6(1), 42-47. <https://doi.org/10.1525/ctx.2007.6.1.42>



12. Mary Kosut (2000) Tattoo Narratives: The intersection of the body, self-identity and society, *Visual Sociology*, 15:1, 79-100, DOI: 10.1080/14725860008583817
13. Polson, C. J. (1948). Tattooing. *Transactions of the Medico-Legal Society for the year*, 16(3), 96–102. doi:10.1177/002581724801600303
14. Saks, M. J., Albright, T., Bohan, T. L., Bierer, B. E., Bowers, C. M., Bush, M. A., ... Zumwalt, R. E. (2016). Forensic bitemark identification: weak foundations, exaggerated claims. *Journal of Law and the Biosciences*, 3(3), 538–575. doi:10.1093/jlb/lsw045
15. Dey A, Das K (2017) Why We Tattoo? Exploring the Motivation and Meaning. *Anthropol* 5: 174. doi:10.4172/2332-0915.1000174
16. Wohlrab, S., Stahl, J., & Kappeler, P. M. (2007). Modifying the body: Motivations for getting tattooed and pierced. *Body Image*, 4(1), 87–95. doi:10.1016/j.bodyim.2006.12.001
17. Fagr F H Y. Human Bite Mark. *J Forensic Sci & Criminal Inves.* 2017; 4(4): 555647. DOI: 10.19080/JFSCI.2017.04.555647.
18. Sreenivas, Sujith C. "Human Bite Mark-A Physical Evidence." *Medico-Legal Update* (2019): n. pag.
19. Miranda, Michelle, et al. "Tattoos and tattoo inks: forensic considerations". *WIREs Forensic Science*, vol. 2, no. 1, 2019. <https://doi.org/10.1002/wfs2.1360>
20. Sauerwein K, Butler JM, Reczek KK, Reed C (2023) Bitemark Analysis: A NIST Scientific Foundation Review. (National Institute of Standards and Technology, Gaithersburg, MD), NIST Interagency Report (IR) NIST IR 8352. <https://doi.org/10.6028/NIST.IR.8352>

