

Human Bite Mark – A Physical Evidence

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Abstract

Forensic Odontology include evaluation of human bite mark which is a trace evidence for connecting the assailant and the victim of a crime. Evaluation of the morphology of bite mark and comparison with the dental pattern of the suspected person helped in providing a corroborative evidence in identification of the criminal¹. Most of the bite mark evaluated in Forensic practice does not reproduce all the characteristics of the dental pattern of the suspected person as the complete dental arch is not reproduced on the injury however in most of the cases the pattern of the anterior dental arches or their portion is impregnated on the injury². The study involved evaluation of all the injuries due to human bite over a period of nine years on the dead body brought for medicolegal autopsy and on the subjects involved in crime brought for examination of wounds and certification of injuries. Evaluation of the bite mark and its correlation with the dental characteristics of the suspect revealed that the evidence is corroborative and supportive. As the number of physical characteristics for comparison and identification became more , it resulted in a better match between the morphology of bite mark and the dental characteristics of the suspected person³. The more the number of imprint of teeth seen clearly on the skin the better was the chances of identifying the assailant, however the chances of other people having similar dental pattern cannot be excluded completely.

Keywords: *Human bite, Physical evidence.*

Introduction

Bite marks can be considered to be a spectrum of injuries ranging from imprint of a suction mark, marks indicating violence ranging from bruising with no indentations to deep lacerations made by the penetrating teeth. Proper preservation, analysis and interpretation of human bite mark can be useful in establishing the criminal or excluding the innocent. Care should be taken during bite mark analysis and evaluation as it may lead to miscarriage of justice or conviction of the innocent⁴. The first and the foremost thing is the recognition and identification of a human bite mark. The preliminary examination include observing the upper and lower jaw pattern, marks of individual teeth, and the dynamic nature of biting process and force transmitted^{5 6}. This

helps in the retrospective evaluation of the emotional state of the assailant at the time of committing the crime. The multiplicity of bite also helps in exposing the deliberation on the part of the assailant. The central area of petechiae or erythema is the end result of pressure and suction due to pressure of the tongue on the soft tissues. The presence of sexual emotion after sinking the teeth into soft tissues is accompanied by the pleasure of suction of soft tissues which may vary in the force exerted but which is invariably present in a love bite resulting in the central erythema. In the living these manifestations may get altered or may even heal by the passage of time. Hence a scaled photograph should be taken as a record and evidence immediately during the examination of the injury in the living. Comparative evaluation with the suspected persons dentition is only possible after the assailant is identified and produced for Forensic odontology studies⁷. A bite mark is not a result of *static confrontation*, but is a product of a dynamic process resulting during or following the movement of the victim, and the assailant during or after the bite process. Hence the bite mark may or need not be a reciprocal imprint of the dental configuration and pattern, but may show

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modifications due to the dynamicity during the course of bite. The act of biting is considered as a “process” rather than being an event.

Aims and Objectives

Comparative Evaluation of the pattern ,nature and configuration of human bite mark with the dental morphology of the biter.

By examining the morphology of the bite mark whether it is possible to positively identify the dentition of the assailant(biter).

Materials and Method

Forensic odontology studies conducted in the Department of Forensic Medicine, Govt. Medical College Kozhikode over the year 2004-15 were evaluated. The details of physical characteristics of the bite mark was compared with the dental morphology and the points of characteristic similarities were correlated and reevaluated for the purpose of the study. Permission for the same obtained from institutional research and ethical committee .

Inclusion criteria: The medico legal cases subjected for odontology studies at the Department with photographs and details of the subject who had inflicted the injury were included in the study .The author had personally observed the dental morphology and bite mark during the medico legal examination involved in this study.

Bite mark analysis:

Presumption that every persons dentition is unique is based on the fact of the entire dental characteristics, which is often not seen as imprint in a bite mark. The characteristics which makes the bite mark unique are the differences of anatomical surfaces, restorations, prosthesis, decay, malposition, malrotation and peculiar shapes, however a sufficient representation of the uniqueness is not represented in the bite mark always.

Method of comparison:

Direct examination of the bite mark and dentition of the suspected person and comparison of dental morphology with bite mark was done as it provides a three dimensional comparative evaluation. Photographs and casts were preserved for the purpose of documentation. The bite indentations in the living are photographed to

prevent loss of evidence due to healing process.

Observations

Seven cases of bite marks were evaluated. Five of the seven bite marks had only the imprint of anteriorly placed teeth and were pressure abrasion marks. One of the cases showed deep bite mark lacerations resembling the teeth of upper and lower jaw with avulsion of soft tissues. The central portion of the bite marks showed erythema or evidence of suction in two cases. Three cases of the six bite marks were resolving .

Case 1: History of attempting to stifle cry of a child during sexual abuse. Bite mark showed the imprint of upper incisor tooth on the back aspect of web space of thumb and index finger during the attempt of smothering. The mammelons of the incisors were seen as imprint on the bite mark.

Case 2: Death during smothering – The bite mark was inflicted during attempt to close the mouth using the hand. The gap between the incisor teeth of upper jaw was visible on the bite mark and only the imprint of incisor teeth were seen on the bite mark.

Case 3: A lacerated wound (0.7 x 0.2 x 0.3cm) was seen incidentally on the inner upper quadrant of right breast in a case of homicide due to blunt injury inflicted to the head. Even though the injury resembled teeth pattern the presence of a single laceration did not raise the concern, however after a few days the accused in the case of homicide was brought to the Department for physical examination. The doctor who conducted the autopsy of the deceased observed the unusual presence of a single protruding upper incisor tooth, which made him suspect the injury on the breast of the deceased to be the bite mark of the suspected assailant. This was later confirmed by the accused during his confession. The morphology of the love bite mark on the breast was also consistent with the attrition and dimension of the incisor tooth.

Case 4: An adivasi couple after intake of country made liquor was found physically abusing each other during the late night hours which the people around considered as part of daily routine after alcohol intoxication. The next day the female was found dead with injuries over the cheek and face. The injuries were found to be characteristic human bite marks. Circular areas of avulsed soft tissues were seen with the margins

showing teeth marks adjoining the lacerated avulsion.

Case 5: Bite over the right cheek in a sexual assault revealed upper and lower arches. The bite mark was resolving during examination. The absence of 1st premolar on the left lower quadrant of the subject was corroborative with the abrasion free area within the lower arch on left side. The age of the injury was also consistent with 5 days old history of crime. The attrition of the incisor tooth also had an influence on the nature of the abrasion of upper and lower arches of bite mark. There was a gap between the first and second incisor, on the right upper quadrant of the suspect which was also seen as an area of non-continuity along the bite mark injury on right side of upper arch.

Case 6: Healed bite mark showing healed abrasions with abrasions grazing towards the central area due to attempt to close the mouth after the bite. The upper jaw teeth were seen as larger teeth marks and the spacing of tooth between incisors were evident on the bite mark. The broken canine of the right lower quadrant was seen as intact area corresponding to the absent tooth.

Case 7: Typical love bite with central area of erythema (suction contusion). The gap between the incisors of upper and lower jaw was evident on the bite mark. The angulation of upper outer incisor tooth was seen as an obliquely displaced bite mark



Photo 1 dental morphology



Photo 2 bite during stifling cry



Photo 3 bite during smothering



Photo 4 bite during sexual violence



Photo 5 healed bite mark



Photo 6 love bite with suction

Table – 1: Dental morphology and pattern/nature of injury

	Complete / Incomplete	Dental pattern regular/not	Nature of injury	Missing tooth	Irregularity	Mal aligned	Broken tooth
Case 1	Incomplete	Irregular	Pressure abrasion	Nil	+	+	Nil
Case 2	Incomplete	Irregular	Pressure abrasion	Nil	+	+	Nil
Case 3	Incomplete	Single tooth	Laceration	+++	+	-	Nil
Case 4	Complete	Regular	Laceration	Nil	-	-	Nil
Case 5	Complete	Regular	Abrasion	+	+	-	Nil
Case 6	Complete	Regular	Healing abrasion	+	+	+	+
Case 7	Complete	Regular	Pressure abrasion	Nil	+	+	Nil

Discussion

Attempts to smother or stifle the cry of a person with the bare hands had resulted in the victim biting the assailant and the bite mark was partial having imprint of incisors of upper jaw. The dental morphology of the cutting edge of the central incisors were impregnated on the bite mark pattern. The compressive effect of pressure of the hand on to the teeth during the process of bite had resulted in pressure abrasion in all the cases. This would have resulted in the inability of the victim to close the mouth completely and biting the palmar and dorsal surface of the hand which was within the mouth, pressing into the mouth preventing the closure of the mouth. Love bite is revealed by the central suction erythema in one case and the vulnerable site of bite in the other (cheek). The pattern revealed the imprint of upper and lower jaw teeth upto the molars in both the cases. The pressure abrasion suggests the nature of the emotion which resulted in the sinking of teeth into the soft tissues. The gravity of suction applied after sinking the teeth into the soft tissues results in the central erythema. In one of the cases, there was a superficial lacerated wound on the breast which resembled tooth mark, the accused person of the crime had only one incisor on his upper jaw, otherwise both the jaws were adentulous. The explanation provided by him to the police was that he

had not voluntarily bitten the breast, but had sank his only tooth deeper into the soft tissues of the breast as the tooth was preventing him from applying the gums on the breast to get enough suction and satisfaction. Bite mark as a part of physical violence was seen as avulsed lacerated wounds with circular nature, wound margins showing teeth pattern. When both the arches of upper jaw and lower jaw was evident on the bite mark, the upper jaw teeth mark were found larger and prominent. The immobile upper jaw teeth mark appear to have been used to fix the jaw onto the soft tissues and the action appear to have been mediated by the mobile lower jaw teeth.

Conclusion

Comparative evaluation of bite mark which function as a physical evidence is only a corroborative evidence which is more useful in exclusion rather than positively identifying a person⁸. As the number of tooth pattern increases in the bitemark a better comparison and evaluation is possible during Forensic odontology studies. Just as we record identification marks in every medicolegal report/certificate for identifying the subject examined, the more the number of similarity between the morphology of bite mark and suspected dentition of a subject the greater the probability that the bite mark

is that of that particularly subject. The upper and lower jaw tooth imprint on the bite mark showing the arches and number of teeth were more prominent in situations of love bite rather than bite inflicted accidentally in situations like attempted smothering. Avulsed lacerations were seen on the bite only when the bites was under the influence of alcohol, the emotion during which period could not be exactly evaluated. The imprint of the broken or absence of tooth was well marked on the bite mark as intact area within the arch adjacent to the teeth marks . Minimal distortion of the teeth or its angulation were not marked on the bite pattern possibility due to elasticity of the skin. The unique nature of the dental morphology with respect to irregularity of anteriorly placed teeth (gap, crowding and overlapping), loss of tooth, broken tooth, malaligned teeth makes the identification of the individual more specific and reliable⁹.

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