Methods for the Analysis of Human Bite Marks

ABSTRACT: The comparison of features within a bite mark injury with the dentition of a suspect may be required during the course of a criminal investigation. A review of the literature regarding bite mark analysis has been undertaken to determine the value of this evidence. Bite marks in skin are complex injuries consisting of abrasions, lacerations, and contusions, caused by the crushing action of the teeth and related structures. Front-line investigators need to recognize and interpret these features, but no standard method of information collection or comparison has been agreed. Many classifications of bite mark types have been proposed, but do not appear to aid mark analysis. Investigations of bite strengths and sucking forces have been inconclusive. Insufficient information exists as to the accuracy and reproducibility of the representation of the dentition by tissue pathology. Histological analysis and collagen staining techniques have attempted to define the area of injury in detail, but have limited application. The quality of the mark is determined by numerous intrinsic and extrinsic factors. Distortion and shrinkage of the tissues introduce dimensional disturbances that require elimination before a comparison can be undertaken. No method exists to quantify and correct these distortions. The investigator must be aware that self-inflicted marks often occur among children and that other events may replicate bite mark injuries. The most common bite mark comparison methods employ an intermediate template produced from the suspect dentition that, when overlaid onto a scale photograph of the injury, demonstrates correspondence. No agreement exists regarding the individuality of human dentition, minimum level of correspondence required to positively identify the assailant, and the accuracy to which tissue pathology can represent these details. It is concluded that bite mark comparison can only exclude a suspect and should not be used for positive identification.

KEY WORDS: Bite marks, bite mark analysis, bite mark comparison, dentition, forensic, mark, odontology, teeth.