G6 What We Can Learn From Cadaver, Volunteer, or Actual Case Material in the Analysis of Bitemark Evidence Using the Full Spectrum of Photographic Techniques

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Learning Overview: After attending this presentation, attendees will learn the value of different modalities of experimentally produced bitemarks, the analysis of each type of experimental bitemark, and its value when applied to "real-life" cases. The full spectrum of forensic photographic techniques will be shown and their advantages for use in real-life bitemark analysis.[2-4,5-7]

Impact on the Forensic Science Community: This presentation will impact the forensic science community by showing the full spectrum of forensic photographic techniques and their advantages for use in real-life bitemark analysis.

The limitations of laboratory bitemark research techniques vis-a-vis actual case material will provide some useful objective evidence for practical application. When applying the different forensic photographic techniques to the laboratory-produced bitemarks and evaluating the results, one will learn the value of each of these techniques.[1,7,6] Then, when applying these results to actual bitemark cases, there should be improvement in the final analytical results.

To date, laboratory research with bitemarks has been limited to producing bitemarks on cadavers, anesthetized fetal pigs, and live human volunteers. This has been done with plastic teeth mounted on a mechanical device (vice grips) using hand/arm pressure with a vertical closure on a non-moving subject. In all this research, there is no movement on the part of the subject, real teeth are not used, and the muscles of mastication are only approximated. These experiments, although providing some valuable information, are not a real-life duplication of bitemarks inflicted by the victim on the attacker or by the attacker on the victim.

The results of laboratory bitemark research can be augmented by using ultraviolet light, Alternate Light Source (ALS), in addition to ambient light for the enhancement of surface detail and Infrared (IR) light to help analyze wound depth.[2-4,6]

The basic information from laboratory-produced bitemarks on cadavers, fetal pigs, and human volunteers, along with the full-spectrum forensic photographic techniques, when applied to real-life bitemark cases, should produce increased accuracy and be based on some degree of scientific research.[1,4,5]

The analysis of real-life bitemarks in human flesh may produce valuable information for the authorities in the pursuit of justice. The comparison of the suspected biter's teeth to the bitemark left on the victim should be tempered with the many variables that occur in the actual situation.[1,2,5,7] The distortion that occurs due to many various factors, such as the movement of both parties, the elasticity of the skin in the area bitten, and the amount of tissue bitten.

The one constant in bitemarks is that the DNA of the biter may be obtained. In many cases, this can make an identification or an exclusion to a reasonable degree of certainty. However, the analysis of the pattern injury can provide useful information not only for exclusion or inclusion of the biter, but other information, such as position of the biter, adult versus child, age of the bite in relation to time of death, etc. The addition of forensic photographic techniques can enhance such an analysis.[3,5-7]

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Reflective Ultraviolet, Analysis, Comparison