F3 The Perfect Storm II: The Strengths, Weaknesses of Bitemark Analysis, and Answers to Inquiries Requesting Fact-Based Protocols for This Forensic Discipline

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The goal of this presentation is to discuss the current status of bitemark identification opinions in three specific areas: (1) strengths; (2) weaknesses; and, (3) discussion of the future uses of bitemark comparison in criminal investigation.

This presentation will impact the forensic science community by clearly describing the issues regarding the necessity to substitute DNA analysis in cases involving human bitemark evidence.

Three years since the 2009 National Academy of Sciences Report (NAS Report) was published, things have been quiet regarding any revision of the methods and protocols allowed by the recognized forensic bitemark certification organizations. The American Academy of Forensic Sciences has issued a general recognition of the need for improvements in forensic application of certain disciplines. The ABFO has argued that bitemark comparisons still qualify as acceptable forensic science. The available literature on the foundations of bitemark comparisons is currently being reviewed by the ABFO in response to direct questioning by the Congressional Judiciary Sub-Committee tasked to establish the breadth, substance, and gaps in this area of forensic investigation. Reviewers outside this organization have completed their own literature investigation. Do these summaries tell us anything regarding a common ground of proof supporting bitemark comparisons? As of August 1, 2011 the answers have yet to be revealed. The content and status of these reviews will form the core of this presentation.

1. STRENGTHS

- Cases involving biting activity occur during assaults and homicides. Victims can be either children or adults. Sometimes an assailant may be bitten by the victim. In all of these cases, the identity of the biter is the foremost challenge. Currently available DNA technologies have recently changed the hierarchy of investigation of bitemarks. The penultimate resource to biter identification is via collection and processing of DNA containing saliva from both the region of the skin injury and also from clothing worn at the time of the attack. Well informed jurisdictions have adopted this protocol as a standard operating procedure. Nevertheless, this type of evidence must be collected in a timely manner due to its susceptibility to environmental degradation. This makes the identification of the skin injury as a bitemark the paramount task of the initial medico-legal investigation. Forensic dentists are dedicated to educating law enforcement and hospital staff to the appearance of human bitemarks and the proper collection, documentation and preservation of this biological evidence.

2. WEAKNESSES OF BITEMARK COMPARISONS

- Poor to non-existent scientific support regarding scientific issues published in NAS report and questions posed by the Congressional Judicial subcommittee to the ABFO in 2011.
- Multiple analysis methodologies and unrealistic expectation of the validity and judicial presentations of bitemark pattern analysis. Unopposed research now available indicates skin injury patterns are unreliable for comparison purposes.
- General lack of scientific determination of levels of certainty used by dental experts.
- History of expert disagreement in court regarding fundamental levels of bitemark pattern analysis.
- Resistance of odontology organizations to consider the basis of the numerous United States exonerations which overturned opinions of experienced board-certified forensic dentists.

3. ISSUES AND SOLUTIONS

- The weaknesses in Section B are currently unresolved.
- The default solution is to determine that DNA analysis is the best method for bite identification and that bitemark identification opinions should only be used for extra-judicial investigation. It is mandatory to refocus U.S. odontologists towards better training and education of law enforcement, hospital, dental and medical professionals about the basis of bitemark identification and biological evidence collection. The increased use of DNA analysis as a substitute for dependence on bitemark comparison is evident in the numerous cases in the United States and is the hallmark for well informed medical-legal agencies throughout this country and abroad.

Bitemark Research, Bitemark Unreliability, DNA

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