F31 Report on a Closed Population Bite Mark Case Involving Two Unrelated Individuals With Similar Dentitions

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After attending this presentation, attendees will understand and appreciate how similar dentitions may be found in a closed population from unrelated individuals. It will show the need for the study of bite marks on a microscopic level for comparison purposes.

This presentation will impact the forensic science community by serving as a reference for those dental practitioners and other experts who may be requested to provide a bite mark testimony before the court that bite marks on the gross scale, in a closed population, may not be as individualized as previously thought. Additionally, this shows that skin as impression material is not accurate enough with macroscopic examination to determine the differences in two similar but unrelated individuals that allow for an accurate bite mark comparison. Further studies using microscopes such as the scanning electron microscope are recommended to study the individual tooth characteristics of the human bite mark.

It has been the basis of bite mark comparison that no two unrelated individuals in a closed population would have dentitions that produce bite marks close enough in similarity as to prevent an outcome other than inconclusive to the case. This case disproves that assumption because two of the three persons of interest in the case had similarly positioned teeth and because of that both individuals fit a well defined bite mark. An odontologist would expect this similarity if the two persons of interest had been orthodontically treated. However, both individuals had not had orthodontically treated dentitions, yet their arch characteristics are close enough that when compared macroscopically to the bite they were virtually indistinguishable. This will be demonstrated by use of the Mideo Systems' CASEWORKS*eis* ™ program. This is a software system designed for the forensic sciences. The Mideo Systems' ™ program is a state of the art system capable of managing all aspects of the forensic case from comparison to court exhibits. It has been used for managing both identification and bite mark cases. The system, as used in this presentation, is capable of capturing digital images and bringing them to a 1:1 relationship for comparison. This allows comparison of various images while using filters and other tools available in the software.

The purpose of this case review is to demonstrate that despite using current state of the art comparison equipment a conclusion in a bite mark case involving similar dentitions may not be reached without the needed microscopic information. Standard digital photography alone cannot be enhanced enough to show these small irregularities in the dentition. With this information, forensic odontologists, will realize that even in a closed population there may not be unique enough dental characteristics to form a scientific conclusion as to whom can be reasonably ruled out or included. It is also hoped that with this information the forensic odontologist and other researchers will be spurred into studying the microscopic aspects of bite marks and provide ample scientific data as set forth in the February 2009 report on forensics by the National Academy of Sciences.

Forensic Science, Bite Marks, Closed Populations

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