F34   How to Make a Good Impression - Polyurethane and Pattern Injury Analysis

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After attending this presentation, attendees will understand the utilization of forensic odontology methods and procedures in pattern injury analysis for medical examiner's and investigators.

This presentation will impact the forensic community and/or humanity by demonstrating how forensic ododntology methods and materials in select toolmark and pattern injury can provides an over-looked investigative tool in death investigation. The techniques used in bite mark analysis, including dental impressions, diagnostic models and digital photography, can be applied to various other toolmark and pattern injuries.

This presentation will present an overlooked diagnostic tool to assist the medical examiner and law enforcement in death investigation involving select blunt and sharp force pattern injury analysis. Evaluation and preservation of the wound pattern can be beneficial in determining the implement used. The authors will present a case study involving blunt force trauma resulting in several well-defined pattern injuries. Using materials and methods common to forensic odontology, a permanent record of the pattern injury was made and digital photographic documentation was collected.

In November 2004, the Medical Examiner's office was called to investigate a police involved death of a white male who had been evading pursuit by law enforcement. The suspect sustained multiple dog bites and the forensic odontologist was requested to assist in the investigation. In addition to the multiple bite marks on the extremities and head, there were several well-defined pattern injuries on the left temporal region of the scalp. Utilizing a vinyl polysiloxane impression material an extremely accurate impression was made of the pattern injury. In addition, using the same dental material, an impression was made of the object suspected to have caused the injury. The impressions were cast in polyurethane polymer to create a three-dimensional duplicate of the pattern injury and surrounding tissue. Digital color photographs were taken of both the pattern injury and suspected object using a Konica-Minolta 8-megapixal digital camera. The images were downloaded into Adobe Photoshop   v7.0 and made life-size for metric analysis and comparison purposes. Utilizing the dental impressions, urethane models and digital images, the pattern on the scalp was determined to match that of the base of a radio collected at the scene.

This case clearly illustrates how investigators and medical examiner can utilize a forensic odontologist and dental procedures to investigate pattern injuries. The urethane models provide a virtually indestructible record of the pattern injury while Photoshop   provides for metric analysis.

With the exception of teeth and oral structures, the odontologist is not an expert in toolmark analysis. However, the odontologist can provide technical expertise and methodology for evidence collection in pattern injuries.

Medicolegal death investigators and medical examiners should consider using a forensic odontologist for pattern injury analysis.

Pattern Injury Analysis, Toolmark Analysis, Forensic Odontology