F43 Use of Ultra-Violet Light in Victim Identification: A Case Report

Henry J. Dondero, DDS, Nassau County Medical Examiner's Office, 2 Emerald Drive, Glen Cove, NY 11542*

The goal of this presentation is to discuss how the forensic odontologist must be able to utilize all devices and methods available in the quest for victim identification. This presentation will deal with the use of an ultra-violet light source to detect fluorescence in certain composite resins or sealants.

This presentation will impact the forensic science community by encouraging the forensic odontologist to be aware of the various investigative modalities available.

The forensic odontologist may not be able to identify every victim he or she encounters due to a multitude of reasons. It is indeed unfortunate when a lack of complete antemortem records will often preclude the certification of a dental identification. Sometimes, however, a relatively small amount of dental information can contribute to a positive identification when considered along with information gleaned from other disciplines. The following case is an example of such an identification; what is particularly unique is that the dental information was ascertained by the use of an ultra-violet light source.

The case involved four victims of a suspicious house fire; later confirmed by the fire marshall as arson. The victims were believed to be members of the same family and included a mother, a teenage son, and two pre-teen daughters. The husband/father in this family was at work when the incident occurred. A complete postmortem dental examination on the adult female was performed and a dental chart with a full mouth series of radiographs was generated. These records were compared to the antemortem dental records supplied by the family dentist. Based on this examination and comparison of both post and antemortem records a positive dental identification of the adult female was established.

The medical examiner had ordered an evaluation of mitochondrial DNA on the victims and it was determined that all the individuals shared the same mDNA. Based on this laboratory finding coupled with the positive dental examination of the mother, the medical examiner concluded that the three children were indeed members of the same household.

A postmortem dental examination of the teenage male victim was performed and a dental chart was produced. Because this victim did not have any antemortem dental records available, a dental identification was impossible. Due to the consistencies of the forensic evidence surrounding this individual, such as age estimation, location at the scene, gender, jewelry, and mDNA a positive identification was deemed credible.

The two young girls presented a different situation. Because of the closeness in their ages there was no significant dental evidence to accurately separate them by the usual age determination techniques. Both victims' mandibles were locked in a slightly open position with approximately 15mm measured at the central incisors. For various reasons resection of the jaws was not an option. No restorations were visible on either victim. Both had been seen by a dentist but there were no radiographs taken and restorative charting had not been done. The records did indicate however that an occlusal sealant was placed on tooth #14 on Girl Victim #1 and an occlusal sealant had been placed on tooth #3 on Girl Victim #2. Examination with a #23 explorer was difficult and inconclusive. Utilizing the properties of Ultra Violet light examination espoused by Guzy et al, the fluorescence observed was consistent with the dental record. With this information Girl Victims #1 & #2 could be tentatively identified.

While these consistencies afforded a "probable" dental identification it was considered prudent that a "positive" dental identification could not be certified based on this one parameter alone. This information when coupled with the mDNA match resulted in giving Girl Victims #1 and #2 their proper names.

UV Light, Fluorescent Resins, Probable Identification

 ** Presenting Author*