E6 Mummified Tattoo Rehydration, Photography, and Reconstruction in Cold Case Investigations

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After attending this presentation, attendees will be familiar with the procedures conducted by the Pasco County Sheriff's Office in Pasco County, FL, on a small amount of mummified tissue in order to rehydrate, clean, and expose the details of a colored tattoo on a skeletonized cold case from 1989. This protocol allowed for effective photography using various color filters to expose the details and color of the tattoos to aid in the process of identification.

This presentation will impact the forensic science community by offering details into the successful process used on a small amount of mummified tissue recovered with skeletal remains. The process allowed for the exposure, reconstruction, photography, and preservation of tattoos, which has the potential to significantly improve case solvability for highly decomposed or skeletonized remains.

On January 24, 1989, the skeletal remains of an individual were found in an orange grove in Dade City, FL. The individual has remained unidentified and, in 2007, new efforts were initiated to further investigate the case in an attempt to make an identification. The skeletal remains were sent to the University of South Florida Forensic Anthropology Laboratory for a skeletal analysis to estimate the biological profile, and forensic investigators at the Pasco County Sheriff's Office began working with a small piece of mummified tissue found with the remains. The initial police report in 1989 stated that the tattoo on the mummified skin was "what appeared to be a rose with green leaves, purple stripes going from the rose to an area that resembles a spider web colored in yellow and black lines;" however, no efforts had been made at the time to clean or rehydrate the tissue.

After the tissue was rehydrated with a 50/50 glycerin and water solution in 2007, Pasco County Sheriff's Office forensic investigators cleaned the still-submerged tissue with sterile swabs. Prior to and after rehydration, the exposed tattoos on the tissue were thoroughly photographed using colored light filters at different nanometers (including red, orange, yellow, green and blue light filters, each at 450, 485, 530, and 570 nanometers) to visualize the different aspects and colors of the tattoos. These photographic techniques allowed for the reconstruction of very detailed and colored tattoo images that were very different from the original police description, including a bicep tattoo containing the initials "HFD," wings, flames, a cross, a rebel flag and swastika, as well as a forearm sleeve tattoo of a green flaming dragon winding down the arm around a nude female with red high heels on a rebel flag background. These updated details and images were included in the law enforcement agency bulletins and media releases.

This case is an excellent example of the use of innovative forensic techniques employed by the Pasco County Sheriff's Office that allowed the details of the preserved tattoo to be exposed and reconstructed almost 20 years after the remains were recovered. A limited amount of research has been published regarding the use of various imaging techniques to visualize tattoos on cadavers; however, most of these publications involve fresh cadavers where rehydration and cleaning is not necessary.[1-3] This presentation clearly outlines the protocol performed on the mummified tissue which can aid forensic investigators with other law enforcement agencies or medical examiner's offices if presented with similar mummified tissue that may have the potential to contain tattoos. By having the opportunity to update the tattoo description with clear photographs and reconstructions, the visibility and solvability of an unidentified cold case in law enforcement investigations, as well as mass disaster situations or human rights recoveries, will be dramatically increased.

References:

1. Clarkson H, Birch W. Tattoos and Human Identification: Investigation into the Use of X-Ray and Infrared Radiation in the Visualization of Tattoos. *Journal of Forensic Sciences* 2013:58(5):1264-72.
2. Oliver WR, Leone L. Digital UV/IR Photography for Tattoo Evaluation in Mummified Remains. *Journal of Forensic Sciences* 2012:57(4):1134-36.
3. Starkie A, Birch W, Ferllini R, Thompson TJU. Investigation into the Merits of Infrared Imaging in the Investigation of Tattoos Postmortem. *Journal of Forensic Sciences* 2011:56(6):1569-73.

Cold Case, Tattoos, Filter Photography