H15 Methods for Optimizing Postmortem Fingerprint Recovery From Mummified Fingers

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After attending this presentation, attendees will: (1) understand that traditional methods used to obtain postmortem fingerprints from mummified fingers are not always easy or successful; and, (2) learn two additional methods that can be used to optimize postmortem fingerprint recovery from mummified fingers.

This presentation will impact the forensic science community by introducing two additional techniques for obtaining postmortem fingerprints from mummified fingers.

In many medicolegal death investigation offices, a routine part of the postmortem examination of bodies involves the collection of fingerprints. A variety of challenges exist when attempting to take fingerprints from certain decedents. Decomposition, water immersion with subsequent wrinkling of finger pad skin, and trauma may cause great difficulty in obtaining suitable fingerprints at autopsy. Some of the most challenging cases involve mummified fingers, where shrunken, wrinkled, and hardened finger pads can make it nearly impossible to obtain suitable prints. The forensic literature includes recommendations regarding how to overcome these challenges.[1-4] Commonly employed methods involve attempts at rehydration, followed by various techniques for print acquisition, such as powder and adhesive lifts and Micro-Sil™ Silicone Impression Compound.[4] Despite these recommendations, obtaining useable prints is not always possible. Those responsible for obtaining postmortem fingerprints should use all available means to acquire suitable fingerprints.

This report presents two relatively simple methods using baby powder and transillumination, which may be useful in obtaining suitable fingerprints from mummified fingers. Both can be performed on fingers *in situ* or following finger removal from the body.

The baby powder method is most useful for situations in which the fingers are extremely darkened by mummification. Following attempts at rehydration, as previously reported in the literature, the finger pads are dried. Next, white powder, such as baby powder, is lightly brushed onto the finger pad surfaces, using a fingerprint brush. The powder adheres to the fingerprint ridges and enhances the dark grooves of the fingerprint resulting in what appears to be a "negative image" of how one normally visualizes an inked finger pad. A photograph or 10X to 20X microphotograph of the white-powdered finger pad can then be produced, with subsequent digital inversion for comparison purposes.

The transillumination method is more complex but still relatively simple to perform. Using forceps and a thin, sharp scalpel, the subcutaneous tissues underlying the finger pad are accessed via the skin proximal to the finger pad. The subcutaneous tissues immediately underlying the finger pad are then carefully removed by planed excisioning with the scalpel. The hardened subcutaneous tissues can literally be carved away in thin layers, working outward, toward the skin surface of the finger pad. Once enough tissue is removed, a relatively thin band of epidermis and underlying dermis will remain. Using a fiber-optic light source, the planed surface underlying the finger pad is illuminated. The overlying finger pad will be transilluminated, allowing for photography of the fingerprint ridge detail and subsequent digital inversion of the photograph for comparison purposes.

Reference(s):

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2. Kahana T., Grande A., Tancredi D.M., Penalver J., Hiss J. Fingerprinting the deceased: Traditional and new techniques. *JFS.* 2001 Jul;46(4):908-12.
3. Spitz D.J. Identification of Human Remains (Chapter IV-Part I). In: Spitz W.U. (editor). *Spitz and Fisher's Medicolegal Investigation of Death.* (4th edition). Springfield IL: Charles C. Thomas; 2006, pp 199-203.
4. *The Fingerprint Sourcebook.* U.S. Department of Justice. Office of Justice Programs. National Institute of Justice. www.nij.gov.

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