



D43 The Corrosive Effect of Blood Regarding the Forensic Identification of Fired Projectiles

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Attendees will be briefed on the proper collection and storage of projectiles collected from the bodies of shooting victims so that the corrosive effect of blood does not destroy the microscopic markings used in forensic firearms examination

This presentation will impact the forensic community and/or humanity by demonstrating that blood has a corrosive effect on projectiles. In addition, it will establish a method of collection and storage that prevents this destruction, so that forensic firearms evidence is not lost.

The goal of this presentation is to present to the forensic community, particularly surgical personnel and forensic pathologists, a study that demonstrates the destructive nature of blood in prolonged contact with projectiles and how this contact hinders forensic identification of the projectiles.

This presentation will review a portion of a study conducted for the purposes of a Master's Thesis. This study examined if blood hampers forensic firearms examiners' efforts to connect a projectile to other projectiles or a particular firearm. Because bullets are often recovered from victims of shootings, blood may be left on the projectile or the projectile may be stored in a container with blood. The main objective of this study was to determine if this blood destroys the microscopic markings used by forensic firearms examiners in classifying and identifying bullets. An additional objective of this study was to begin to understand what component or components of blood play the greatest role in the damaging of bullets. The final objective of this study was to determine if desiccants or a particular storage method could prevent or lessen the damage caused by blood.

This study focused on blood's effects on recovered evidence bullets. In particular, the problem to be examined involves projectiles that are recovered from a victim of a shooting. As it can be inferred, blood first contacts the projectile as it enters the body. The location of this entry is referred to as the entrance wound. The bullet may pass completely through the body, leaving through an exit wound. Many times, the bullet will remain in the body. This study will focus on those projectiles that remain in the body and that are completely surrounded by blood and bloody tissue. These projectiles are usually removed from the body by a surgeon or a forensic pathologist. After a projectile is recovered from the body of the victim, body fluids (specifically blood) may remain on the specimens. It has been observed that the microscopic markings used to identify these projectiles are not present or are present to a lesser degree on these specimens.

The methodology of this study was based on the above factors and the observations of forensic firearms examiners. This study focused on copper jacketed projectiles that are removed from a patient in a hospital or morgue setting. It was structured to recreate evidence, as it is seen in the crime laboratory. A semiautomatic firearm was shot into a recovery medium to obtain the projectiles for this study. Three test fires were obtained and stored as a reference sample. The reference sample was used as the standard in all microscopic comparisons. Additional test sets were created where the copper jacketed projectiles and other materials were placed in a specimen cup that was sealed until the time of comparison. The materials placed in the specimen cup differed depending on the desired variables. The projectiles were removed every fifteen days and subjected to microscopic examination and comparison to the reference set of projectiles.

As a result of these experiments, it was determined that blood does damage projectiles and that this damage hinders a forensic firearms examiner's analysis. This damage increases over time, consuming the identifiable markings of the projectile. In addition, both lysed red blood cells and serum play a role in the destruction of the bullets. It appears the damage was caused by the concert of materials that make up whole blood. Although no correlation can be made between the addition of desiccants and the slowing of the destruction to the bullets, proper collection and storage was determined to stop the corrosive effects of blood. To ensure that this damage does not occur, it is recommended that the projectiles be rinsed with water before they are placed in a storage container. If trace material must be recovered from the bullet, filter mechanisms can be added to this process.

Firearms Examination, Projectiles, Blood