



H132 Cold Case Homicides: DNA Testing of Retained Autopsy Sexual Assault Smears

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Learning Overview: The goal of this presentation is to highlight the examination of retained medical examiner specimens for DNA testing and their use in cold case homicides.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by demonstrating the usefulness of testing archived autopsy sexual assault smears in identifying suspects in cold case homicides.

In 1994, the DNA Identification Act authorized the Federal Bureau of Investigation (FBI) to create a national DNA database of convicted offenders and databases for forensic samples. Prior to this, there was no consistent method for the collection, analysis, and comparison of biological specimens from suspected sexual assault-related homicides.

In the 1990s, vaginal, oral, and anal swabs and smears were collected on certain homicides at the Office of the Chief Medical Examiner (OCME) in Connecticut. The smear slides were reviewed by the medical examiner for sperm, then archived at the OCME. The swabs were sent to the crime lab for ABO blood type identification and possibly Polymerase Chain Reaction (PCR) testing. The crime lab began performing routine DNA testing on samples around 1993. Recent advances in molecular testing have allowed for the extraction of DNA to generate DNA profiles from cytological smears. Therefore, a search for archived vaginal, oral, and anal smear slides was undertaken at the OCME.

An electronic death certificate search was performed for all female homicides between 1990 and 1999. The OCME histology slide archives were searched for sexual assault smears for all 376 female homicides that occurred between 1990 and 1999. Of the 376 female homicides, the OCME had vaginal, anal, and oral slides on 84. Of these, 12 slides had sperm, 44 had no sperm, and 28 had no mention of the presence or absence of sperm in the report. Detectives from the jurisdictions of death were contacted to see if any of the cases were still unsolved. Of the 12 instances with sperm, there were 7 that were still “unsolved.” In these instances, samples were forwarded to the Connecticut State Division of Scientific Services (DSS) for DNA testing and analysis by extraction of DNA from cells on the previously stained and fixed glass slides.

DNA profiles were obtained on all seven cases. Two profiles entered into the Combined DNA Index System (CODIS) resulted in two matches (“hits”). One profile was consistent with the decedent’s husband (who was the suspect). This information was provided to the investigating police agency. Two profiles were mixtures that were not entered into CODIS (vaginal smear with three male contributors and vaginal and oral smear with mixtures of two individuals (one male)). In one case, vaginal swabs detected three contributors (two were male), and the vaginal smear had two contributors (one male). CODIS entries were made for both without any hits. In one case, the vaginal swabs, which included a swabbing of the vaginal smear, detected three contributors (one male), and a CODIS entry was made without any hits.

This review of archival sexual assault smears resulted in DNA profiles that were able to assist in the investigation of three cold case homicide investigations in Connecticut. Given the current advances in both DNA extraction techniques and molecular analysis, medical examiner offices may wish to search their archival histology slides for sexual assault smears that may yield sufficient sperm for DNA analysis on previously unsolved homicide cases.

DNA, Sexual Assault, Autopsy