Case Report

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Deception and Vaginal Slides: Do we need to Preserve a Control Sample of Victims in Every Case of Rape?

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Abstract
Two women were found dead on the bank of a river in India. It was determined that the women had been raped and on postmortem examination, the cause of death was determined to be head injury. The mechanisms of the deaths led to probability that the women were murdered. The doctors, who conducted the examinations, submitted vaginal slides of the deceased for forensic examination. DNA analysis was conducted; male and female fractions of DNA were isolated. The viscera of the deceased were also preserved for toxicological analysis at the time of post mortem examination and part of which were subjected to DNA analysis. The female DNA profiles obtained from the vaginal slides and viscera did not match. Blood samples of four suspects were also collected, subjected to DNA analysis, and the profiles did not match with the male DNA profiles from the vaginal slides. This resulted in questionable samples, and therefore the exhumation of the bodies was recommended and undertaken. DNA profiles were generated from the long bones, teeth, and viscera of the exhumed bodies, which matched only with the DNA profile generated from the viscera, not with the vaginal slides. From a forensic investigation, it was determined that the vaginal slides were fudged by one of the autopsy doctors. There was intentional deception. Implications of this case are made for future investigations of rape victims.

Introduction
Like fingerprinting, decades ago DNA analysis has been revolutionary in forensic investigation and has applicability to rape and murder cases. The identification of the correct evidence is of paramount importance and a critical task in medico-legal investigations in which both medico-legal experts and investigating agencies have to prove the correct identity of the evidence in the court of law. It is well known that results can be invalid due to body samples, such as from vaginal and viscera, being changed accidentally; however, there are possible cases of intentional changes. Deception can be a major problem in crime investigation, especially if it occurs by the very people who are responsible for law enforcement and medico-legal inquiry [1]. We present a case of intentional deception.

Two females were found dead in the same river in Jammu and Kashmir, India. One aged 17 and the other, 27. The youngest one was found on the bank of a river and the other, a few meters ahead. The younger female was unmarried and the other female was married and had a child. The case resulted in national attention and public protests in the region. It was determined that the women had been raped and the police suspected involvement of four men. It was believed that the women were raped and murdered. But the actual cause of death of both the females was ante-mortem drowning. The viscera and vaginal slides were submitted for forensic examination. The forensic report was positive for the presence of sperm in the vaginal slides from both the victims. The slides were submitted for DNA analysis. From the slides of both victims, a male and a female fraction of DNA were generated. Blood samples were collected from the four suspects and the same were submitted for DNA analysis and were found not matching the male fraction of DNA on the vaginal slides. The viscera of both the females kept at the time of post-mortem examination were subjected to DNA analysis and the profiles of the female fractions were generated but did not match the female profiles generated from the vaginal slides. It was concluded that the female fraction generated from the slides did not belong to the deceased. This raised an obvious question of sampling error or deception. It was believed that the vaginal slides might have been fudged by one of the autopsy doctors.

Therefore, the exhumation of the bodies was recommended and carried out. Temporary male shift mortuary facilities were created in the graveyard, x-ray machine was arranged and dead bodies were exhumed in early morning on the order and presence of a magistrate. Also, State government deputed three officials to supervise this exhumation. After exhumation, the postmortem examination was conducted. The entire postmortem examination was videotaped and x-rays were taken of the entire body. The viscera’s were preserved for toxicological analysis. Teeth samples were collected for DNA analysis and tissues collected for histopathological examination. Hymen was found intact. Vagina was preserved in formalin for further examination. Samples for Diatom test were also collected.

The cause of the deaths were confirmed to be drowning by the following findings on second post mortem after exhumation conducted nearly after four months of burial of these bodies:

1. Mud in trachea, bronchi and reaching up to bronchioles.
2. Presence of similar vegetable fibers in mud recovered from respiratory passage and control sample collected from the soil of river.
3. Presence of similar species of diatoms reasonably in good number in tissues and bone marrow of the deceased and in control sample of water.
4. Presence of large area of hemorrhagic spots on lungs (paultaf’s hemorrhages).
5. Petechial hemorrhages on lungs confirmed by histopathological examination.
6. Petechial hemorrhage on heart surface.
7. History of flash flood on that evening in the rivulet.
8. Presence of water in alveoli on histopathological examination.
9. No other cause of death.
The first post mortem examination report mentioned head injury as the cause of death but the skull was found intact on second postmortem examination. In one case a lacerated wound was found but underneath skull was not open. Fracture of nasal bone was mentioned but it was intact on second post mortem and on post mortem x-ray examinations. Viscera and vaginal slides of each of the victims were preserved. The samples were collected in the normal saline for DNA and immediately transferred to the deep freeze. The bottles containing samples were labeled, sealed, and signed by doctors and magistrate. Samples were handed over to magistrate in a sealed parcel with the instructions to maintain the chain of custody and to preserve the samples in deep freeze. The magistrate passed on these samples to Central Bureau of Investigation (CBI, investigating agency) and they brought the samples to Delhi and handed them over to the Department of Forensic Medicine, All India Institute of Medical Sciences, New Delhi.

Case

In this case, a suspicion arose that either the vaginal slides and/or the viscera were accidentally or intentionally changed. Was there deception; that is, faking or fudging of the samples? Thus, a strict chain of custody was maintained for the samples collected on second postmortem examination after exhumation. The samples collected on first postmortem examinations were preserved in separate laboratory, Forensic Science Laboratory, Jammu & Kashmir. Hence, there was no possibility of intermixing with those samples. The DNA was isolated from these two slides using Differential Extraction method wherein DTT (Dithiothreitol) was also used. This method is used to isolate DNA from a mixed sample of sperm and non-sperm (epithelial cells). DTT is used to break open only the non-sperm cells whereas SDS is used to break up the sperm cells called sperm fraction. The DNA from the viscera was isolated using protocol of Sambrook et al., [2]. The isolated DNA was checked for its quality and quantity, and subjected to PCR using Identifier kit (ABI) using the protocol as mentioned by the manufacturer.

Credible quality of DNA was isolated from the vaginal slides and viscera of the victims as well as from the fresh blood samples from the four suspected men which were kept at the time of postmortem. All the samples were subjected to PCR and genotyping using ABI Identifier kit (AmpFISTR Identifier). On comparison, the DNA profile obtained from the fresh blood samples of the four accused men did not match with the DNA profile obtained from the male fraction obtained from the vaginal slides. Further, the DNA profile obtained from the viscera preserved during examination of the victims did not match with the DNA obtained from the female fraction from the slides. The DNA profile generated from the teeth of both the deceased preserved during exhumation matched with that of the DNA profile generated from the viscera but not with the vaginal slides, thus confirming that viscera belonged to both of the deceased. This confirmed the fact that fudging of the vaginal slides of both the deceased had occurred.

An obvious question arises: How did the doctor manage the deception? The gynecologist, who had preserved the samples at the time of first postmortem, admitted later to CBI (investigating agency) that, in fact, she had never collected samples from the deceased. She confessed that she had collected post coital samples from two women who had come to her gynecology Outpatient Department for routine checkup on next morning and prepared the slides, which were later on handed over to Chief Medical officer. The officer in turn passed on these slides to the police and the police officer submitted these to FSL, Kashmir. The confession confirmed our findings, and charges were laid against the doctor.

Discussion

In sexual offences, the DNA Fingerprinting is an important technique to prove the charges of sexual intercourse and to establish the identity of the assailant. For this purpose the preservation of vaginal slides/swabs are recommended at the time of examination of the victim of rape or of the deceased at the time of post mortem examination wherein rape and murder is suspected.

The preparation of post coital slides for analysis is common in clinical practice. Benshop et al., reported that of 88 vaginal swabs (post coital) collected (44 cotton and 44 on nylon flocked), the autosomal profiles were obtained up to 72 hrs of TS (time since intercourse) [3]. Similar study has been carried out by Mayntz-Press et al., with commercial kits (AmplISTR Y filer, Powerplex Y and Y-PLEX12) and with in-house made kits (MP1 and MP8) for YSTR system [4]. They could amplify DNA extracted from vaginal swabs collected ≥ 3 days post coital. Delfen, et al., have reported that DNA profile can be obtained from a seven day post coital sample [5]. Thus, it can be concluded that from credible samples, if preserved properly, valid results can be obtained, even after a long period of time. Raina, et al., have reported a case where STR typing of nuclear DNA has successfully identified individuals mainly using teeth samples nearly after two years of incidence [6].

Honda, et al., reported that the samples collected from two rape and murder victims (mixed seminal/vaginal secretion stains) were preserved for 25 yrs. After 25 yrs, the DNA was successfully isolated from these samples and amplified [7]. Most important, the results were deemed to be admissible to court.

Commonly, vaginal slides/swabs are preserved in sexual assault cases, and play a significant role in sexual offences. Da Silva, et al., have reported that the quantity of the cells present in the vaginal swabs taken from the rape victims and some other biological materials collected and then transferred to the vaginal slides, were 3.3 billion times more probable, and thus, sufficient to carry out DNA analysis in rape cases [8].

In the present case, the vaginal slides along with viscera were preserved during post-mortem examination. It was possible to cross check if the DNA profile obtained from the viscera preserved matched with those of the DNA profile (female fraction) generated from the vaginal slides. In ordinary circumstances, only vaginal slides are preserved without any control sample of the victim. The DNA profiles generated are presumed to be of the victim and the assailant. With this case, a possibility of accidental or intentional exchange of exhibits arises. Therefore, it is recommended that in cases where DNA Fingerprinting has to be carried out, a control sample of the victim (blood in living or blood along with the viscera in deceased) should be preserved to verify that the vaginal slides and control samples belong to the same individual and to rule out any possibility of intentional or accidental exchange or fudging of exhibits at any stage. However, given the presumed circumstances of these cases, it would be just as easy to manipulate the control specimens, as it is the actual medico-legal specimens. The use of witnesses in the autopsy and collection of specimens, together with the appropriate labeling of specimens and the use of tamperproof seals may be more helpful. Such environmental controls are more likely to preserve the evidence than the process of just collecting control data.

In the current case, it was found that the vaginal slides were fudged by one of the doctors who carried out the initial autopsies. There was deception. The doctor is now awaiting trial.
References


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