

CASE REPORT

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Forensic Identification of a Rapist Using Unusual Evidence

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ABSTRACT: This case report demonstrates a rape case, where no semen, hair, or fingerprints were left by the perpetrator at the crime scene, but rather uncharacteristic biological and physical evidence in the form of a lollipop and a pair of glasses. Three separate forensic laboratories collaborated using conventional forensic methods of PCR DNA typing, photography, and toolmark comparisons to provide investigators with scientific evidence which in turn was instrumental in bringing a violent criminal to justice. The importance of evaluating each item of evidence and realizing its forensic value is stressed in this case report.

KEYWORDS: forensic science, rape, DNA, glasses, lollipop, mug shot, STR

On March 16, 1997, shortly after midnight a single woman living alone on a ground level apartment in a metropolitan area was sexually and physically assaulted by an unknown assailant while sleeping. The victim was battered with a large piece of cement, which the assailant brought in with him to the scene of the crime. The victim lost consciousness intermittently but was aware of the assailant kissing her and attempting to rape her.

As the attacker continued his assault and was subsequently unsuccessful in raping his victim, his physical attack to the rest of her body (head and upper torso) increased causing the victim to lose consciousness completely.

Upon regaining consciousness, the victim immediately filed a complaint at the local police station where a special investigation team was established. This was not the first attempted rape employing this method in the area, and a possible suspect in these cases had not as yet been identified. The victim was able to provide the detectives on the case a description of a man wearing glasses. The victim was sent to the hospital where a sexual assault evidence collection kit was taken during a physical examination.

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The scene-of-crimes unit recovered from the woman's apartment her blood stained sheets and bedding, the large piece of cement used to attack her, a pair of glasses not belonging to the victim, the victim's clothing worn during the assault, and a partially eaten lollipop stuck to the bloodied sheet.

This case report is presented to show the interplay and cooperation among the various laboratories within a forensic identification unit. The purpose of a police forensic identification unit is to provide investigators with varying scientific evidence originating from items of evidence found at crime scenes. This evidence in turn, assists investigators and detectives in locating and bringing suspected perpetrators to justice. In this case, the expertise of a number of laboratories, including the forensic biology, toolmarks, and photography laboratories, was employed during the investigation. These labs were able to provide essential information in a case where the suspect, because of his not leaving behind biological evidence in the form of semen, wrongly supposed he had left behind no evidence that could be retraced to him.

The pair of glasses (Fig. 1) found at the scene of the crime ultimately led the detectives to the suspect. The glasses were taken and shown to a large number of opticians in the city, in an attempt to locate the origin of this particular set of frames. The store was found and the owner, from the prescription of the glasses was able to provide the investigators with the name of the man who had originally purchased these frames. He remarked to the investigators as an afterthought, that this same person had coincidentally purchased a new pair of glasses the previous week.

The police now had the name of a suspect and proceeded to search the police computer, consequently discovering that this same suspect had a previous sexual assault charge and quite recently had been arrested for pick-pocketing. The detectives acquired the suspect's booking photograph from his recent arrest and were surprised to realize that the man in the photograph was wearing similar glasses frames as those recovered from the rape crime scene.

Following is a description of the contribution of the various forensic laboratories which provided the scientific evidence required to bring this particular case to court and the subsequent confession of the suspect. It was remarked during the court proceedings that because of the strong forensic evidence in this case, the chances of a lawyer obtaining an acquittal for the client were scarce. This may have contributed to his confessing and the subsequent plea bargain that was accepted on his behalf. The perpetrator ultimately received 15 years in prison for this crime.

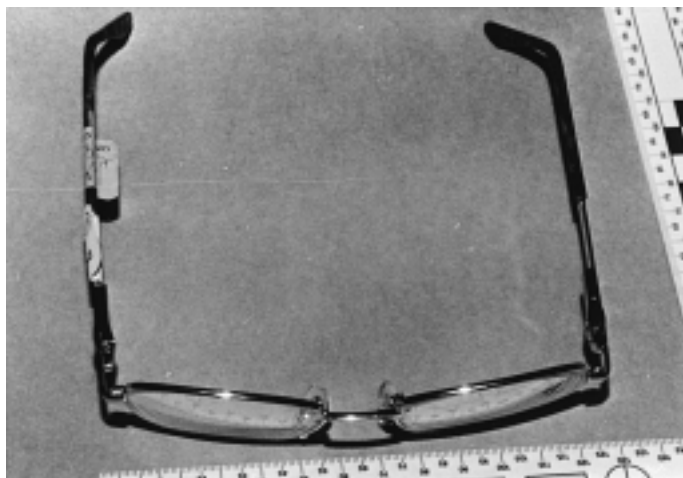


FIG. 1—The glasses found at the crime scene.



FIG. 2—The suspect's booking photograph from a previous arrest.

The Toolmark and Photography Laboratories

The glasses (Fig. 1) were submitted to the Toolmark Laboratory and the negative of the booking photograph (mug shot) (Fig. 2) was submitted to the Photography Laboratory. A description of the exhibits ensues: The glasses had a metal frame with brown-clear mot-

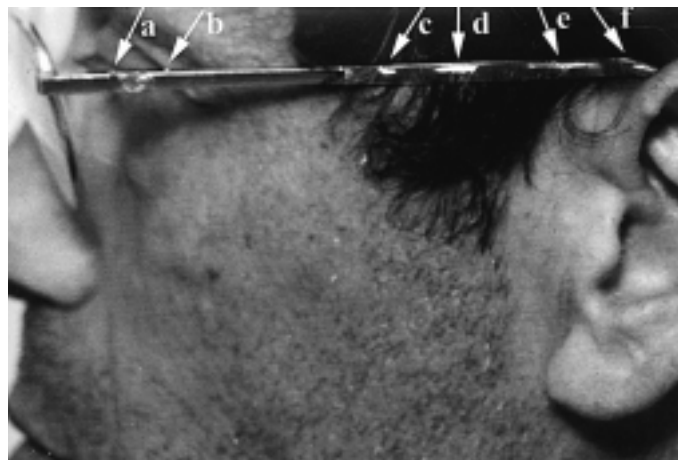


FIG. 3—Left ear-piece (a) Nick, (b) Speck of white paint, (c–f) Features in mottled plastic tip, details were enhanced to maintain visibility after re-production.

tled plastic ear-pieces. On the lenses and on the ear-pieces there were small specks of white paint. (An interesting piece of evidence in itself because the occupation of this suspect was that of a handyman, employed to do home improvements.) There was a minor nick on the metal part of the left ear-piece (Fig. 3).

The booking photograph was taken using standard INP procedures (1). The photograph is a composite of three exposures taken with a studio camera on 9 by 12 cm film. The right half is a full body shot, the upper-left quarter is an on-face portrait, and the lower left a profile. The subject of the photograph was wearing glasses. (In oral communication with the booking photographer, we learned the subject wanted to remove his glasses for the picture but the photographer insisted they remain on.) The exposures were correct, however, the depth of focus was noticeably shallow. Fortunately the glasses in the profile exposure were adequately in focus.

The procedures employed by the Toolmarks and Photography Laboratories were as follows: all the marks examined on the glasses from the negative were in the profile exposure, since the glasses in the on-face exposure were not in focus. There were no dimension references in the profile exposure, so the scale of the booking photograph was estimated by dividing the width of the glasses in the on-face exposure of the negative, by the width of the actual exhibit. This scale was used as the enlargement factor in printing the profile exposure.

The positions (Fig. 3) of the nick (a), speck of white paint, (b) and the pattern of the mottled plastic, and (c) on the glasses ear-piece were compared in the profile print and on the glasses themselves and were found to match perfectly.

In conclusion, the importance of high resolution booking photographs was reinforced. The three-exposure concept proved to be essential in matching the marks from the photographs to those found on the exhibit.

The Forensic Biology Laboratory

The items of evidence received to the biology laboratory were as follows: a sexual assault evidence collection kit taken from the victim, her clothes worn during the attack, sheets, and bedding from the victim's bed, a pair of glasses, and a partially consumed lollipop. No semen was found on any of the items of evidence. Microscopic examination of the samples from the sexual assault evidence collection kit also provided no evidence of the presence of sperm.

Human blood was found on the sheets and the boxer shorts belonging to the victim. After confirming with the detectives that the lollipop did not belong to the victim, it was taken, along with material from the sheet, material from behind the nose pieces of the glasses, and blood samples from the victim and the suspect for comparison for DNA testing.

From the lollipop DNA was extracted from the stick close to the candy where one would expect both saliva and epithelial cells. The candy itself provided no quantitative DNA. Smudges of blood, (presumably the victim's) were also found on the stick.

In an attempt to retrieve usable DNA from the glasses, the inside of the plastic nose pieces were swabbed and the Chelex extraction method was employed (2). The inside of the nose pieces was preferred in order to prevent contamination, because according to the detectives, during the course of the investigation many people had handled and tried on the glasses.

For all the other items of evidence, the phenol-chloroform extraction method was used (3). The DNA extracted from all the items was amplified using the PCR method for the following markers: D1S80, CSF, TPOX, and TH01 (4,5). The products of these amplifications were run on polyacrylamide gels and visualized and compared using silver staining (5).

The results of these comparisons showed the following: 1. The source of the blood on the sheet could have originated from the victim and not from the suspect. 2. The biological evidence found on the lollipop stick consisted of a mixture of more than one DNA profile. The profiles recovered from the lollipop stick match the combination of the profiles defined as those belonging to the victim and the suspect. (Apparently, from the victim's blood and the suspect's saliva.) The possible profile of the second person that, in addition

to the victim, contributed to the mixture of genetic material found on the lollipop is presented in Table 1. Based on statistical data regarding the Israeli Jewish population, one out of approximately 480 people could be that contributor. (It should be noted that if we do not accept the assumption that one of the contributors of the genetic material found on the lollipop is the victim herself, the probability of finding two other random people whose mixture of genetic profiles will match the mixture found on the lollipop becomes reduced to one out of 600 thousand.) 3. The glasses did not provide a reportable profile because of the presence of non-specific bands. Although the suspect's profile was observed most strongly, other faint bands were seen and so the glasses proved to be an unsuitable item for this PCR analysis, even though an attempt to prevent contamination was done.

In summary, in a rape case where only uncharacteristic evidence in the form of a lollipop and a pair of glasses was recovered from the crime scene, a combination of excellent police work in locating a suspect, and the cooperation of three forensic laboratories provided the scientific evidence required to bring to justice the criminal who committed this crime. This case illustrates the importance of cooperation and communication among the various disciplines of a forensic identification unit when assisting in an investigation. It is also important to stress and remind investigators that even items of evidence containing no blood or semen can be the source of pertinent information in the investigation of sexual crimes.

References

1. Evidence Technician Photography Guide. Israel Police Instruction Dept. (Hebrew) December 1980;57-62.
2. Walsh PS, Metzger DA, Higuchi R. Chelex® 100 as a medium for simple extraction of DNA for PCR-based typing from forensic material. *BioTechniques* 1991;10, 506.
3. Sambrook J, Fritsch EF, Maniatis T. *Molecular cloning: a laboratory manual*, Second Edition, Cold Spring Harbor, New York, 1989;9-16.
4. Sajantila A, Budowle B, Strom M, Johnsson V, Lukka M, Peltomen M, et al. PCR amplification of alleles at the D1S80 locus: comparison of a Finnish and a North American Caucasian population sample, and forensic casework evaluation. *Am J Genetics* 1992;50:816-25.
5. Promega Technical Manual Gene Print™ STR Systems. Promega Corporation, 2800 Woods Hollow Road, Madison, WI 53711-5399 USA. Printed 8/96.

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TABLE 1—Genetic profiles of victims, suspect, and on the lollipop.

	Genetic Markers			
	D1S80	CSF	TPOX	TH01
Lollipop	18, 24, 31	10, 12, 13	8, 10	7, 9, 9.3
Victim	18, 31	12, 13	8, 10	9.3, 9.3
Suspect	18, 24	10, 12	8, 8	7, 9
Possible profile of second contributor (see text)	18, 24 or 24, 24 or 24, 31	10, 10 or 10, 12 or 10, 13	8, 8 or 8, 10 or 10, 10	7, 9