

CASE REPORT

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Patterned Injury and Its Evidentiary Value

REFERENCE: Rao, V. J., "Patterned Injury and Its Evidentiary Value," *Journal of Forensic Sciences*, JFSCA, Vol. 31, No. 2, April 1986, pp. 768-772.

ABSTRACT: A rape-homicide victim was stomped by her assailant leaving a unique patterned injury on her scalp. Two methods were used to subsequently match the patterned injury on her scalp to the pattern on the shoe of the assailant that was found at the crime scene.

KEYWORDS: pathology and biology, criminalistics, injuries, impressions, toolmarks, stomping, patterned injury, scalp, shoes, Play-doh®, clear acetate paper

A 19-year-old white female homicide victim was observed by a passerby lying seminude on the banks of a north Miami lake. Investigation revealed she was a prostitute and was picked up by her assailant at a bar and was never again seen alive.

Autopsy Findings

In addition to being sexually assaulted, the deceased had bite marks on her left nipple, on her chin, and on the left side of her face anterior to the left ear. The bite mark on her nipple resulted in nearly complete avulsion of the nipple from the areola. The cause of death was strangulation. On the right side of her face there were focally discontinuous contused abrasions with a vague circular pattern to the injuries. On the left side of her scalp there were circular and semicircular patterned contusions, each approximately 5 to 6 mm in diameter. Examination of the scalp showed extensive galeal hemorrhage subjacent to the injury.

Discussion

There were no eyewitnesses to this assault; however, there were two very important pieces of circumstantial evidence that were obtained from the body, that is, the bite marks and the patterned injury on the scalp. Preservation (for subsequent jury presentation) of the bite mark evidence was made by the forensic odontologist.

The patterned injury on the scalp (left temporal area) consisted of several circular contusions each approximately 0.5 to 0.6 cm in diameter with areas of uninvolved scalp between them (Fig. 1). The question was: Was this ringworm or a patterned injury? This question was answered by the demonstration of full thickness galeal hemorrhage subjacent to the

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FIG. 1—*Patterned injury on scalp.*

injury, confirming the pattern to be traumatically induced. To preserve the evidence, clear acetate paper was overlaid on the injury and a tracing using a marking pen was made. This method of documentation is inexpensive, exact, and can be done by the average pathologist. As a visual aid to the injury, it is self-explanatory and convincing.

One speculation as to the type of weapon that caused the injury was that it possibly was the embossed sole of a shoe. However, lack of communication between the medical examiner and the crime scene personnel resulted in a delay of several months in confirming this thought. Subsequently, it was learned that there was a shoe left at the scene that had an embossed pattern on the rubber sole (Fig. 2). The pattern consisted of small squares and circles. Police investigation resulted in the arrest of an individual who, interestingly enough, had the other shoe in his truck. The assailant was known to have visited the scene the night before the discovery of the body. Because of the soft texture of the dirt at the scene, the assailant had trouble getting his vehicle out and hence had to be towed. The tire tracks were noted at the scene.

The prosecution of this case was based solely on circumstantial evidence. The subject was booked into custody and a positive match was made between his teeth and the bite marks on the deceased. The pair of shoes was subsequently brought to the Medical Examiner Department and a mold using Play-doh² was made of the shoe sole (Fig. 3). This material was chosen because of its easy availability, pliability, and on exposure to air it hardens. Having taken a mold of the shoe sole, some experimentation was in order. A live fair-skinned volun-

²Kenner Products Co., Cincinnati, OH.

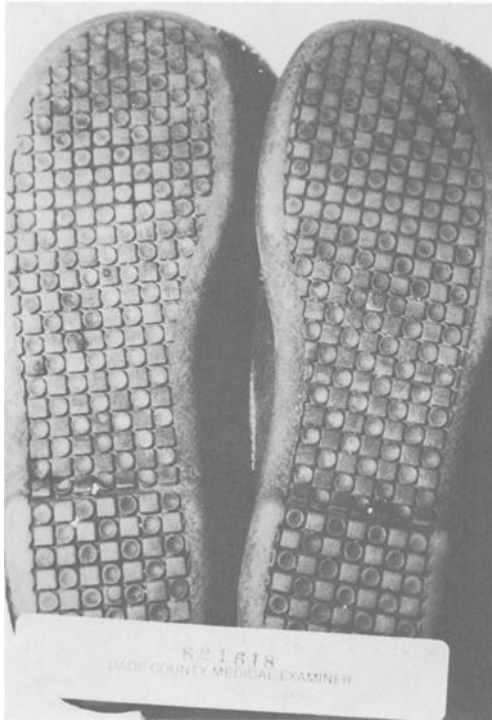


FIG. 2—Sole of the shoe found at the crime scene.

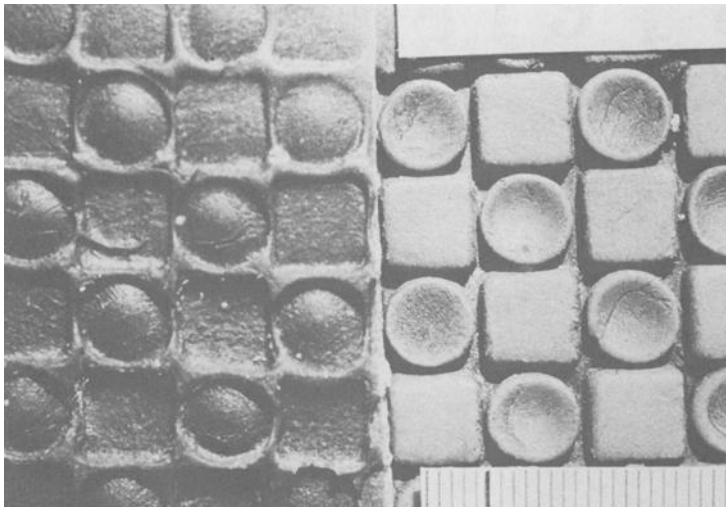


FIG. 3—Composite picture. On the right the shoe sole and on the left the mold of the shoe sole.

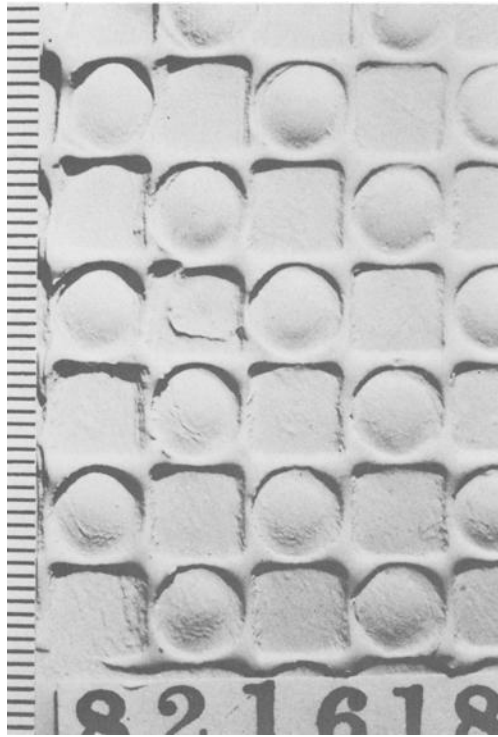


FIG. 4—Mold after it has hardened.

teer was chosen for the purpose of attempting to duplicate the injury pattern. The hardened, already molded Play-doh (Fig. 4), was used as a blunt weapon by holding it in the palm of one's hand, and the volunteer was then struck on the back with considerable force. The pattern resulting on his back was identical to that observed on the victim's scalp, after considering the two differing anatomical sites.

The need for the experiment was the fact that the pattern on the sole consisted of alternating rows of circles and squares of somewhat similar dimension. However, both on the scalp of the deceased and on the volunteer's back, the predominant pattern observed was, in fact, the circles with relatively nondescript intervals in between. The reason for this, it would seem, is that the circular areas on the soles had the centers scooped out like a suction cup, whereas the squares on the other hand were flat and flush with the sole surface. It is my opinion that the edges of the circular areas resulted in the imprint.

Conclusion

In this case, the cause of death was not the issue, but the identification of the implement used to inflict the unique pattern on the decedent's scalp and probably on her face was of utmost importance, since it was the link that tied the suspect (1) to the scene and (2) to the deceased. Skin (soft and elastic), unlike cartilage, is a poor receptor for a toolmark [1]. This factor, coupled with the deceased's long hair, to some extent blurred the patterned injury on her scalp.

Identification of a toolmark involves expertise and subsequent court testimony of a toolmark examiner. In this case, class characteristics [2] were noted, that is, size and general

configuration of the individual components to the pattern. It is probably because of the nature of the "tool" and the contour and surface (scalp with long hair) where the imprint was left, that individual characteristics were not detected.

A number of sophisticated procedures are employed in the science of toolmark evaluation [3]; however, in this case with photography, clear acetate paper, and Play-doh, an important piece of circumstantial evidence was preserved. Recognition and proper documentation of the pattern at autopsy, and a close collaboration with the investigative agency all assisted in the successful prosecution of this case.

Postscript

At trial the defendant chose to represent his case. He had no questions to pose to the medical examiner. The jury awarded him the death penalty for his crime. If the case is not appealed on the basis of inadequate counsel, he will be awaiting his sentence on death row.

References

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