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Death Due to Assault with Coconut Scraper; Application of Locard's Principle in Medico-legal Investigations

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Authors' contributions

All authors have contributed to preparation of the paper. Authors MV, DSK and DA conducted initial forensic investigations. Authors PRR and MV structured the text and conducted literature survey. All authors have approved final version of the paper.

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Case Study

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ABSTRACT

Introduction: The Locard's principle is based on the fact that "every contact leaves a trace". This case highlights its application at the scene, autopsy, examination of assailant and weapon.

Case Report: A dead body of 33 years old woman was found inside the kitchen, lying in a pool of blood mainly around the head. A coconut scraper with blood stains was present nearby.

An autopsy revealed a split laceration situated on the occipital scalp with underlying depressed comminuted fracture accompanied by fresh bleeding. There were contusions and abrasions over both upper limbs. The cause of death was attributed to cranio-cerebral injuries due to blunt force

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impact. The examination of the alleged assailant showed patterned abrasion with serrations on the left and right palm.

Conclusion: Contusions of upper limb of the deceased were compatible with defensive injuries. The patterned injuries on the palms of the suspect suggest that he was holding a blade of the scraper with his left hand while supporting the shaft of the scraper with right hand.

The blood on the wooden part of the scrapper indicates the contact point of the scraper with the head.

Keywords: *Locard's principle; coconut scrapper; serrated injuries.*

1. INTRODUCTION

Locard's principle has been conceptualized by Dr Edmond Locard [1877-1966], based on the fact that "every contact leaves a trace" [1] and elaborated as [1] "Wherever he steps, whatever he touches, whatever he leaves, even unconsciously, will serve as a silent witness against him. Not only his fingerprints or his footprints, but his hair, the fibers from his clothes, the glass he breaks, the tool mark he leaves, the paint he scratches, the blood or semen he deposits or collects. All of these and more, bear mute witness against him. This is evidence that does not forget. It is not confused by the excitement of the moment. It is not absent because human witnesses are. It is factual evidence. Physical evidence cannot be wrong, it cannot perjure itself, it cannot be wholly absent. Only human failure to find it, study and understand it, can diminish its value". Although at the time of publication these rules principally applied to trace evidence related to print (for exchange finger print or shoeprint), fibre and blood, today one can add the very substance that defines each human being – DNA [2]. This case highlights its application during crime-scene investigations, autopsy and examination of the suspect and the weapon.

2. CASE REPORT

A dead body of 33 years old woman was found inside the kitchen of her residence, lying in prone position with a pool of blood around the head (Fig. 1). Her clothing was undisturbed. A coconut scraper with blood stains and a broken hair clip were found on the floor (Fig. 2) and were sent to the Government Analyst for further analysis. The plate with scrapped coconut was also found on the floor.

At autopsy, a split laceration was situated on the occipital scalp with underlying depressed comminuted fracture accompanied by subdural

bleeding. There were two lacerated grazed abrasions on the left side of the face and contusions and abrasions over both upper limbs. No sharp weapon injuries were present. The cause of death was attributed to cranio-cerebral injuries due to application of blunt weapon.

The circumstances revealed an argument with her spouse over the earnings and extramarital relationship of the deceased woman. The husband of the victim was interrogated by the Police and produced for medico-legal examination on the same day. Examination of the alleged assailant showed patterned abrasion on the left palm, 1 x 3 cm in size, directed forwards and outwards obliquely from inner margin of the left palm. The injury consisted of parallel, serrated linear scratches with regular gaps between them, directed forwards with a few pointed ends (Fig. 3).



Fig. 1. Body found at the scene

Another elongated patterned abrasion was found on the right palm, ¼ cm x 3 cm in size, directed forwards and outwards from inner margin of the right palm (Fig. 3). The psychiatric assessment of the assailant revealed acute stress reaction with

suicidal thoughts and was transferred to Mental Hospital for further management.



Fig. 2. The coconut scrapper: note the blade (white arrow), handle (yellow arrow) and the wooden base with blood stains, and the broken hair clip



Fig. 3. Serrated abrasion on left palm (white arrow) and elongated abrasion on right palm (orange arrow) and closer view of the blade

3. DISCUSSION

The findings of the scene of crime, the weapon, the victim and the accused, all contributory evidence, has been comparatively analyzed according to the Locard's principle [3] to obtain physical traces and clues about death of this young woman.

A coconut scrapper with teeth like serrated blade, which is a common kitchen instrument in most households of the country, was located at the scene. The key medico-legal issues to be answered are, whether the cranio-cerebral injuries sustained by the victim have been caused by assault with the coconut scrapper and could the injuries on the alleged assailants hands have also been produced by handling the same instrument.

At autopsy, the injuries found on back of her head showed depressed comminuted fractures with underlying brain injuries and haemorrhages. Unlike other forms of traumatic deaths such as

firearm or sharp force injuries, which occur under a relatively limited number of circumstances, the deaths resulting from blunt force trauma occur in a variety of scenarios [4]. In this case, the injury found on the back of the head was compatible with a heavy blunt weapon trauma. Hair clip may have been broken due to the same trauma.

Hence, there had been very little doubt about that head injury was produced by impact of the wooden bench of the scraper. In this context, an assailant might have handled the weapon through serrated metallic blade and neck of the scraper. The photographs of the blade of the instrument are correspondently superimposing with the pattern of the injuries of the assailants palms. Furthermore, equi-distance linear scratches are correspondent to the distance between the striations in the instrument [5]. The direction of palm injuries also indicated that he was holding the blade of the scraper with his left hand while supporting the shaft [neck] of blade with the right hand. For confirmation, the forensic

scientist can perform a test injury with the original instrument received as material evidence [6].

Biological fluid identification is an important facet of evidence in forensic investigations [7]. The blood stains on the wooden part of the scrapper indicate the contact site of the scraper with the victim's head, which was comparable according to analysts report. The DNA analysis on trace material [8] to pin-point the perpetrator would be of no use in this case as both victim and the assailants were cohabitants of the same house.

The plate with scrapped coconut, suggested that incident took place while meals being prepared. Contusions and abrasions over both upper limbs of the deceased appeared to be defense wounds [9] indicating that the victim was conscious and active at onset of the attack. The facial injuries are suggestive of a fall forward following initial impact and also in keeping with the prone position of the body at the scene.

4. CONCLUSION

In conclusion, the present case highlights the importance of sticking on to the basics of forensic sciences such as Locard's principle, for better medico-legal outcomes.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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