

CASE OF IDENTIFICATION OF SNEAKERS BY TRACE EVIDENCE ANALYSIS OF THE REMAINING TRACES ON THE BODY OF THE DECEASED

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Abstract - We present a case of murder with a blunt object. On the body of the deceased were identified specific traces in the form of suffusions. Four people were suspected for the murder. During the investigative four pairs of sneakers were obtained. A full forensic examination was performed which excluded three of the four pairs of suspected shoes. The fourth pair was a match. This kind of research is extremely important in forensic practice and theory, as they allow forensic experts to identify the objects that left specific traces on the body of a victim or deceased. They are also extremely important during investigation of criminal offenses, especially when there is more than one suspect.

Key words: Murder, blunt objects, autopsy finding, specific traces, trace evidence analysis, photo superimposition, identification.

I. INTRODUCTION

In a large percentage of cases in forensic practice on the bodies the deceased specific marks are observed from the affecting objects. Most often, such traces remain in injuries from blunt objects with specific trace leaving surface, enabling the identification of the acting subject. Such traces on the bodies of the victims are a result from impact of objects of surrounding life, clothing and shoes of perpetrators and victims, bites of human or animal teeth, specific parts of vehicles, etc. These facts determine the need for analysis and comparison of the acting subjects and left behind traces. One method is photo superimposition as is presented by us in the case below.

II. MATERIAL AND METHODS

The survey includes specific traces found at autopsy of a deceased man and 4-pairs of sneakers related to the criminal act, described as follows:

OBJECT № 1 - data from forensic examination of the corpse: "... On the upper and lower eyelids of both eyes and both cheekbones areas bluish purple bruising and swelling with diameters 7-8 cm are observed. Under the conjunctiva of both eyeballs there are total subconjunctival hemorrhages. The eyelids are very swollen, the eyes are fully closed. The upper eyelid of the right eye has two wounds with lengths 1 cm and 2.5 cm, with smooth edges and sharp corners. The lower eyelid of the left eye has a similar wound with a length of 1 cm. In the wounds pieces of broken glass with diameters of about 0.1 cm were found. In the inner third of

the right eyebrow a spotted reddish bruise with a diameter of about 4 cm was observed. In the left half the forehead there is a group of linear bruises and superficial wounds with linear form and lengths from 1 cm to 5 cm, which occupy a total area of 15/10 cm. In the same area on the border with the scalp there was a slight arch wound 3 cm in length with arc open back with tissue bridges in the corners. On the nose spotted reddish bruise size 4/3 cm was observed. The nasal bones were broken with multiple fragments. The right malic area has patchy bruising size 3/2 cm. In the area of the right nasal-lip were fold group of spotted bruises with diameters from 0.1 cm to 0.3 cm occupying area of 5/2 cm. The upper and lower lips have bruises with diameters of about 2-3 cm each. The chin has two bruising with a reddish color and size 2/1 cm and 3/1 cm. The left cheek has a reddish purple bruising size 6/1 cm. The right parietal-temporal area of the head has a linear wound length 1.5 cm, which terminates at its lower end with a linear abrasion with a length of 1 cm; the edges of the wound are smooth with sharp corners. Hair over the wound is smoothly cut. The right temporal area of the head above the right ear has a wound with a length of 2 cm, with rough edges. Right ear has 5 linear abrasions with lengths of 0.5cm to 1 cm. The fronto-parietal region of the head has a superficial wound 0.5 cm in length with sharp corners and smooth edges. The left parieto-temporal area of the head has a T-shaped wound length of the rays 2 cm and 1 cm, in the corners there are tissue bridges. In the occipital region of the head there are two arched wounds 5 cm in length and 4 cm grazed and uneven edges and tissue bridges in the corners. In the back of the distal phalanx of the second finger of the right hand there was a deep linear bruise with length 1 cm. On the back of the right hand at the base of the fourth finger a reddish bruise with a diameter of 0.5 cm was observed. In the area of the right elbow there were two red bruises measuring 2.2 cm and 4/1.5 cm. In the outer surface of the right forearm, in its upper third, a superficial linear ulcers 5 lengths of 0.5 to 1 cm was observed. The corners were sharp with smooth edges. On the back of the second finger of the left hand there was bluish purple bruising, size 7/2 cm. The same bruising with diameter 1.5 cm was found on the back of the fifth finger of the same hand, and the same is located at its base. The left elbow has bluish purple bruising 4-cm diameter. The right lumbar area has a deep

reddish bruise linear length of 2.5 cm. At the anterior abdominal wall to the right, in the lumbar region and around the umbilicus and the left there were multiple round shaped bruises with diameters from 0.5 cm to about 2 cm, and some of them especially in the left half of the anterior abdominal wall merge to form irregular reddish purple bruise size to about 15/10 cm. Left front surface of the chest in the upper third anterior axillary line has four grouped round shaped bruising with diameters from 0.5 cm to 1.2 cm. On the front surface of the left shank there was reddish bruise placed parallel to the edge of the tibia in the middle third of the lower leg with size 3/0, 7 cm. In the area of the wing of the left iliac bone there was a yellowish bruise with a diameter of 4 cm".

OBJECT № 2 - a pair of red and white sneakers placed in a standard paper evidence bag. Red and white sneakers with laces and inscription "SHOX" was observed. Sneakers were European size 43, type – fabric, with white leather ties. The soles have four spring pads at the heels. Grapple pattern has complex configuration of three segments separated by transverse line-like limiters and segments configuration pattern type of a "fishbone", in three to four longitudinal lines. In the heel part the grapple pattern has four major longitudinal elements arranged by the type of "spider leg" and ending in a square configuration buttons with a diameter of 1.2 cm without standing out over the rest of the grapple line, which is a type of extended "fishbone". In parts of the concave part of the grapple pattern grit and pebbles were found. There were no traces that could be suspected for the presence of blood.

OBJECT № 3 - two pairs of shoes placed in a standard paper bag for evidence sealed as required ... pairs - two red sneakers with silver fragments and two blue-black Nike – Air sneakers.

OBJECT № 3A - A pair of black-blue sneakers "Nike Air". Sneakers were European size 43, type black leather and blue synthetic fabric with black ties. Grapple pattern on the soles is a complex configuration divided into five segments of curved convex regions with a width of 0.5 cm, in the middle part expand and surround element size 3.5/2.5 cm in which the central part has a convex element in the shape of the logo, surrounded by curved convex elements. In the heel part the grapple pattern has two major elements one with sizes 6/2.5 cm that represents a "herringbone" with oval shape and the other is of an irregular shape and size 10/5 cm at the widest part with sinusoidal form. In the plantar part the grapple pattern has two main elements, one with dimensions 6.5/3 cm, oblong shape and pattern representing a "fishbone". The second element in this area is irregularly shaped, measuring 15.5/9 cm at its widest point and is drawing grapple pattern with sinuous form. In the concave part of the tread pattern there were embedded grit and pebbles. In the object were not found traces suspected for presence of blood.

OBJECT № 3B - A pair of red silver sneakers without laces and inscription "NIKE SHOX". Sneakers are European size 44, as part of the silver and red areas are made of artificial material, but most of the red area - of fabric. The soles have a four spring pads in current areas. Tread pattern in the current portion represents four protruding 4 mm elements with the form of buttons, arranged symmetrically, as their diameters are 3.7 cm, the distance between left and right is 1.3 cm, and between the front and rear - 1.4 cm. On each of the above pads in the central part there is a cross-shaped white in color element, size 0.9/0.9 cm and wide 0.3 cm, not protruding above the general plane of the buttons. In the middle of the already described configuration of the four tampons there was a second recess with a diameter of 2 cm in the middle of which there are cut out elements in the form of an inverted Z, as on the top and bottom side another cut-linear element was observed. Between the heel and the plantar surface the distance is about 3 cm and in the same area a tread pattern of superficial circular elements with diameters of 0.3 to 0.7 cm were observed. In the plantar surface of the sneaker many round elements with a convex buttons with diameters of 1.2 cm to 1.6 cm were found, the distance between them of 0.5 cm to 1.1 cm. The circumference of the plantar part has elements with a round inner part and outer part ending at the same level as the sole. In the centers of the above mentioned protrusions we observed sections with round shape and white color, with a greater height than the surrounding "button" and diameters of 0.3 to 0.9 cm. The tread pattern in the plantar surface of the sole resembles a "button". In the peak area of the plantar part there was a slightly arched configuration measuring about 6 / 1.5 cm in which a gripper part contains 6 slightly sunken circular elements with diameters from 0.4 cm to 0.6 cm. The same configuration ends to the upper surface in the front part of the sneakers on which seems slightly convex, the trade mark of the sneakers (Fig. 1).



Fig.1 – Object № 3B

In some areas in the concave part of the tread pattern we observed embedded grit and pebbles and dried mud. On the sole of the right shoe were found two sections, suspicious for the presence of blood, with the material of which

benzidin probe was carried out. It tested negative for the presence of blood

Injuries to the body and tread pattern of offending sneakers were shot with a digital camera and processed with a graphic editor.

III. RESULTS

Initially we conducted a comparative study of available bruising of the anterior abdominal wall to the right, in the lumbar region and around the umbilicus, as well as the front left part of the thorax in the upper third of the anterior axillary line with the character of the victim relief of the tread pattern on the soles of the sneakers described as object № 3.B. shows that existing disabilities contain elements that form shape configurations of the treads of the quoted sneakers in the plantar surface. The assessment of their mirror images for the above bruising directs them to be a result from elements of the sole of the right shoe. Established grouped circular bruises in the right lumbar region (Fig. 2) show that the same have been obtained from not less than two strokes with the plantar part, it can be specified whether they are done with the right shoe or in the genesis of trace leaving is involved the relief on the left sneaker too (Fig. 3)



Fig. 2 – Suffusions on the abdomen

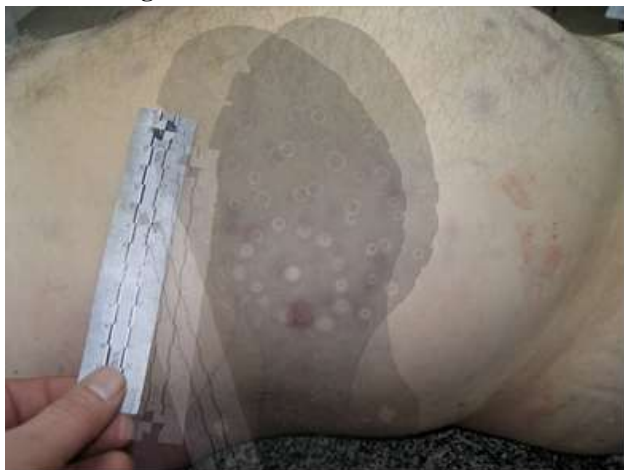


Fig. 3 – Photo superimposing of the shoe (object №3B) and the suffusion on the abdomen

The established group of 4 bruises along the front left part of the thorax in the top third (Fig. 4) fit to be received by one stroke in this area as the comparing of the images correspond to the same part of the grapple pattern of the right shoe (Fig. 5).



Fig.4 – Suffusions on the thorax



Fig. 5 – photo superimposing of the shoe (object № 3B) with the suffusions on the thorax

The described objects are photographed with a digital camera OLYMPUS C-7070 (7.1 Megapixel) and printed on HP 990 Cxi - see attached figures.

Photo processing is done with Adobe Photoshop CS2. First stage an inverted mirror image of the tread pattern on the shoes was made in the horizontal and vertical planes to obtain an image corresponding to the surface in contact with trace leaving body surface. On the second stage we uniform magnitude of the bruising and the soles. Third stage consisted in superimposition of the software processed images with rotation in two-dimensional space, comparing the general configuration and individual elements relevant to the bruises and tread pattern. We got matching characteristic of the bruising with the characteristics of the arrangement of the projecting parts of the tread pattern of the right shoe in the plantar surface for the damage on the left front of the thorax. Comparing the lesions in the right lumbar region we established partial matching. When we overlaid the second

image rotated in a different plane, the number of matches increased.

IV. CONCLUSION

During the forensic examination on the body round shaped bruising with characteristic arrangement located at the anterior abdominal wall to the right, in the lumbar region, the left half of the anterior abdominal wall and left front surface of the chest in its upper third, which correspond to be a result of impact of hard blunt objects with limited and characteristic expressed relief contacting surface where observed. Their complex morphological characteristic corresponds to be partial, negative-positive and likely positive impressions caused by objects that correspond to contact surfaces of the tread pattern of the soles of shoes.

The analysis of the total configuration formed by the bruising in the above areas showed that they are formed as a partial imprint from the impact of distinctly differentiated elements in the configuration of the surface of the acting subject. They can be the basis for trace evidence analysis on the possibility of their occurrence as a result of the impact of a hard blunt object with characteristic contacting surface.

The comparative analysis between the described bruising on the body of the victim and the elements of the convex and concave parts of the grapple pattern of sneakers (objects №№ 2 and 3.a), point to the inadequacy of the characteristics of the lesions with these elements, this means that they can occur as a result of a hit or pressure contact with the grapple of the quoted sneakers.

Comparative analysis between the bruising on the body of the victim and the elements of the grapple pattern on the soles of sneakers object № 3.B. (Fig. 1) shows that the available injuries contain elements that match the form, arrangement and configuration of the protruding elements of the grapple pattern of the quoted sneakers. Analysis of their mirror images shows that the bruising were a result of elements of the front basal part of the right shoe for the bruising on the front left part of the thorax, in the top third (Fig. 4) and the elements of the front basal portions of shoes without the ability to be differentiated the left or right shoe for the bruising in the anterior abdominal wall to the right (Fig. 2), in the lumbar region, the left half of the anterior abdominal wall. The trace evidence analysis and the comparison of the mirror image of the contact pattern of the grapple with the available bruising on the left front part of the thorax in the top third based on marked characteristic elements, the general configuration of the traces and photo superimposition of the images rotated in two-dimensional space, a match was found in the characteristics of the bruising and the nature of the arrangement in a general configuration of a part of the protruding frontal elements of the sole of the right shoe (Fig. 5). The same conclusion could be made for the suffusions of the anterior abdominal wall (Fig. 3) and the lumbar area, in terms of multiple

impacts - repeated compressions or hits with the soles of the quoted sneakers. The general configuration and segment characteristics lead to the conclusion that the bruising on the body could be obtained as a result of an impact with the soles of sneakers object № 3.B.

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