

CASE REPORT

J. Hiss · T. Kahana

Confusing exit gunshot wound – “Two for the price of one”

Received: 25 May 2001 / Accepted: 20 August 2001

Abstract During the post-mortem examination of a 36-year-old shooting victim, two entrance gunshot wounds in the back and only one corresponding exit wound in the chest were detected. The likelihood of a retained fragmented or whole bullet, or an embolic phenomenon was eliminated by full body x-ray examination. The only remaining plausible explanation was that the two bullet tracts had converged within the thorax, eventually exiting through a common exit wound. Dissection of the projectiles' path confirmed this unusual phenomenon. Autopsy techniques for gunshot wound cases are discussed.

Keywords Gunshot wound · Entrance wounds · Common exit wound

Introduction

Establishing the number of bullets based on the number of entrance and exit wounds, combined with radiographic examination of the body is an important factor in the medicolegal investigation of gunshot wound fatalities.

An experienced pathologist should be able to distinguish between entrance and exit wounds, even when unusual patterns are encountered [1]. Difficulties might arise with fragmentation or explosion of bullets that may result in an excess of exit wounds compared to the number of entrance wounds. The opposite (more entrances than exit wounds, without retained bullets) is extremely exceptional. Such an unusual occurrence is presented in this paper.

J. Hiss
National Centre of Forensic Medicine,
67 Ben Zvi street, P.O. Box 49015, 61490 Tel Aviv, Israel

T. Kahana (✉)
Division of Identification and Forensic Science,
Israel Police, National Centre of Forensic Medicine,
67 Ben Zvi street, P.O. Box 49015, 61490 Tel Aviv, Israel
e-mail: abctzipi@matat.health.gov.il
Tel.: +972-3-5127857, Fax: +972-3-6833813

Case report

A 36-year-old male was shot to death in the street in one of the suburbs of the greater Tel Aviv area. After the initial investigation at the scene, where five 7.62 × 39 mm cartridges of an AK-47 automatic assault rifle were collected, the cadaver was transported to the National Centre of Forensic Medicine for autopsy.

On external examination three entrance gunshot wounds were detected in the head, two in the left temporal and one in the occipital areas. These wounds showed the characteristic signs of close range shots (i.e. the presence of powder soot and powder tattooing on the skin). Three corresponding exit wounds were observed, with the path of the bullets easily traceable during internal examination of the brain.

Two additional entrance gunshot wounds each 0.8 cm in diameter and 2.2 cm apart, were found in the upper back with one corresponding 1.4 × 1.1 cm oval-shaped exit wound in the chest midline. The morphology of the entrance wounds was consistent with distant range shooting.

A full body radiographic examination was conducted to locate the presumed retained bullet [1] to no avail. The possibility of a bullet embolism was also ruled out [2]. Since neither metallic fragments, nor a whole bullet were visualised, jokingly one of the autopsy technicians suggested that perhaps two bullets had exited through the same chest wound.

In order to locate the missing bullet, the pathway of the projectiles was traced by careful dissection and sequential photography, since the practice of probing the trajectory has been discontinued in Israel for some time to avoid “false tracks”.

Oddly enough, at the level of the 7th left rib, the two entrance wounds in the back were 2.2 cm. apart (Fig. 1). The paths continued an almost parallel track through the lower lobe of the left lung, where they started to converge. The bullets passed through the pericardium circa 0.5 cm apart (Fig. 2), perforated the sternum with a distance between them of circa 0.2 cm (Fig. 3), traversed the subcutaneous fat 0.1 cm apart and exited the skin of the chest through a common oval-shaped wound (Fig. 4).

Discussion

The purpose of the medicolegal investigation of deaths from gunshot wounds is manifold: extracting the projectiles for further forensic investigation is one of the main objectives, although locating them within the body is not always an easy task.



Fig.1 Two gunshot entrance wounds in the back, located 13 cm to the left of the midline and 46 cm from the vertex

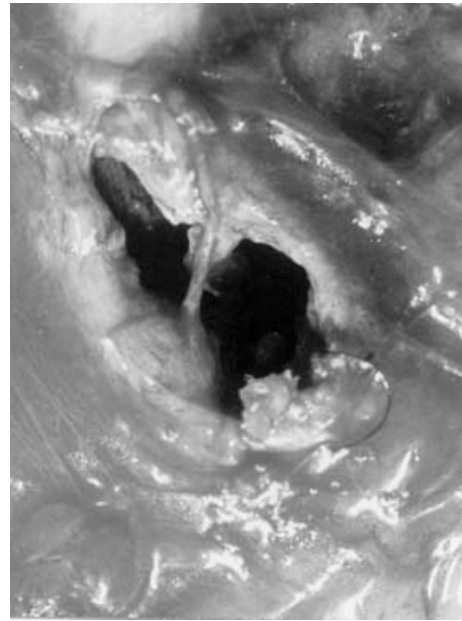


Fig.3 Sternum pierced by two bullets circa 0.2 cm apart



Fig.2 Pericardium pierced by two bullets circa 0.5 cm apart (the specimen was photographed on an interwoven surface which is seen through the defects)

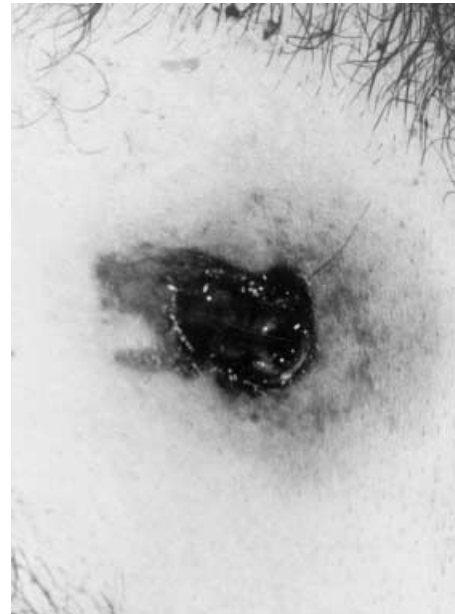


Fig.4 Gunshot exit wound in the chest midline 38.5 cm from the top of the head

In all cases of gunshot wounds it is strongly recommended that x-rays be taken. This includes cases in which the bullet is known to be in the body as well as those in which it has allegedly exited. Radiography is useful in locating the projectile and in determining if metallic fragments are present within the body [3]. This relatively easy task can sometimes fail and a bullet can be overlooked by experienced radiologists due to the “professional blinkers phenomenon” [4]. More sophisticated imaging techniques

such as CT scanning may provide more detailed information including the shooting range [5].

The path of the bullet is best documented by following the track of hemorrhages through the organs before their removal from the body. However, wound tracks through skeletal muscles are usually not associated with major bleeding and require a careful dissection technique. As a rule, current autopsy protocols do not recommend probing the bullet’s path as this procedure can result in false

wound tracks, distort the wound or dislodge the missile. These pitfalls may be avoided by probing the trajectory only following careful anatomical dissection. This procedure is recommended when precise reproduction of the bullet track is of paramount importance to the reconstruction of the event [6]. Some authors advocate the use of a 12-inch long probe, with a blunt end and about 0.5 cm in diameter: a smooth surfaced metal probe which will slide through a wound track requiring minimal pushing [7]. Care must be taken to avoid contact between the probe and the bullet, which can result in obliteration of vital characteristic markings imparted by the barrel on the bullet surface.

In some instances, the number of entrance and exit wounds does not correlate with the number of retained bullets. This can be the result of two projectiles penetrating the body through one single wound, an effect known as piggyback or tandem bullets [8] usually due to bullet and/or weapon malfunction [9, 10]. Another unusual occurrence is a bullet that exits through its own entrance wound, because it has ricocheted off a bone within the body [11].

In the present case, two entrance bullet wounds were detected in the back of the body but only one corresponding exit wound was observed. Radiographic examination of the cadaver eliminated the possibility that a whole or fragmented bullet was lodged within the body. A thorough dissection of the "bloody trails" within the chest cavity

solved the mystery of the missing exit wound. The two paths had coalesced and created the false impression of a unique bullet exit wound.

References

1. Di Maio VJM (1999) Gunshot wounds, 2nd edn. CRC Press, Boca Raton, pp 65–122
2. Mason JK, Purdue BN (2000) The pathology of trauma, 3rd edn. Arnold, London, pp 47–62
3. Froedi RC (1990) Handbook of forensic pathology. College of American Pathologists, pp 218–225
4. Bajanowski T, Karger B, Brinkmann B (2001) Scratched pustule or gunshot wound? A medical odyssey. *Int J Legal Med* 114:267–268
5. Stein KM, Bahner ML, Merkel J, Ain S, Mattern R (2000) Detection of gunshot residues in routine CTs. *Int J Legal Med* 114:15–18
6. Karger B, DuChesne A (1997) Who fired the gun? A casuistic contribution to the differentiation between self-inflicted and non-self-inflicted gunshot wounds. *Int J Legal Med* 110:33–35
7. Spitz WU (1993) Medical investigation of death, 3rd edn. Thomas, Springfield Ill., pp 377
8. Jentzen JM, Luntz M, Templin R (1995) Tandem bullet versus multiple gunshot wounds. *J Forensic Sci* 40:893–895
9. Bentley AJ, Busuttill A, Clifton B (1997) Homicidal tandem bullet wound of the chest. *Am J Forensic Med Pathol* 18:56–59
10. Simmons GT (1997) Findings in gunshot wounds from tandem projectiles. *J Forensic Sci* 42:678–681
11. Grey TC (1993) The incredible bouncing bullet: projectile exit through the entrance wound. *J Forensic Sci* 38:1222–1226