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Elucidation of a strange gunshot injury

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Abstract A 50-year-old obese man sought medical treatment for bleeding injuries in the abdomen and thigh. According to his statement he felt a dull blow on the front of the trunk while he was feeding swans at a lake. The forensic wound findings and the examination of the clothing suggested that the injuries were caused by a single close-range gunshot with the bullet path running nearly vertically downwards and having a total length of 38 cm. The bullet primarily entered in the right mesogastrium, left the body in the right inguinal region, re-entered and ultimately lodged in the right thigh. After confronting the man with the results of the forensic examination he admitted that he himself had caused the gunshot injury accidentally when cleaning his small-bore revolver.

Keywords Gunshot wound · Accidental firearm injury · Self-inflicted firearm injury · Close-range shot · Clinical-forensic examination

Introduction

Accidental gunshot injuries and their different possibilities of origin (self-infliction or infliction by another person) and the clinical course (lethal or survived) have been frequently described in the forensic literature [1–10]. Comprehensive case studies arrived at the conclusion that firearm accidents are usually due to human error and less often to technical defects [e.g. 7, 9]. This is also true of the case reported here, in which the forensic examination helped to reveal the real course of events in an accidental firearm injury at an early stage of investigation.

Dedicated to Prof. Dr. med. Dr. h.c. B. Brinkmann on the occasion of his 65th birthday.

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Case history

A 50-year-old, highly obese early pensioner reported that he had gone to a pond in order to feed swans. When he bent down to wet the food he felt a dull blow and warm blood running down the front of his body. He allegedly did not see any other persons nearby. The injured man went to a hospital for treatment of the bleeding wounds. An X-ray of the right thigh was taken revealing a radiopaque shadow resembling a projectile (Fig. 1).

Examination findings

Inspection of the clothing

The dark-blue fleece sweater worn on top showed an oval defect in the area corresponding to the right mesogastrium. This hole was surrounded by an intense zone of powder soot blackening with thermal damage to the synthetic textile fibers (Fig. 2a).

The T-shirt worn under the sweater showed three defects in the same region arranged one below the other. Between the upper and the middle hole the fabric was intensely discolored gray by powder soot (Fig. 2b).

Physical examination

Above the navel to the right there was a 1×0.6 cm brown dried abrasion on the abdominal skin with a blackened margin (Fig. 3a). 6 cm below and approximately at the level of the navel to the right a transversely oval skin lesion (5×3 mm in size) with a small central defect (2 mm in diameter) and a grayish-black margin was discernible (Fig. 3b). Above and below the right groin there were two further wounds (Fig. 3c, d). The upper lesion had a slit-like configuration and was 8 mm long; the lower one was transversely oval in shape (6×3 mm). With the body in an upright position the two wounds near the groin were localized directly one on top of the other as, due to the



Fig. 1 X-ray of the right thigh with lodged projectile

obese overhanging abdominal walls, the inguinal region was deeply retracted.

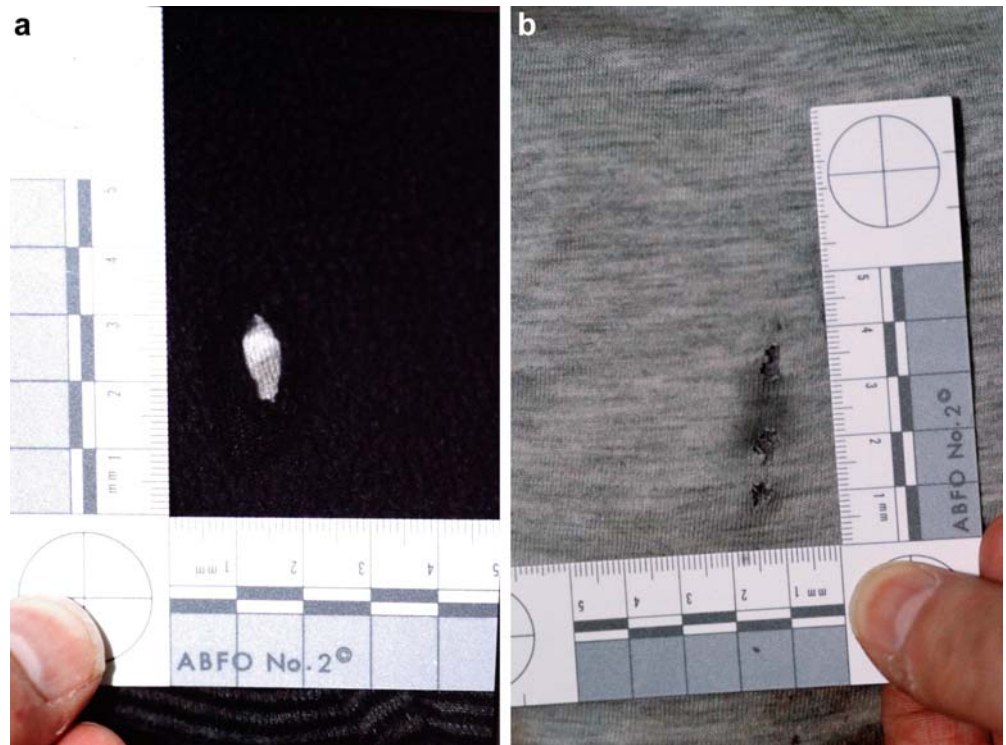
Interpretation of findings

On the basis of all the findings the conclusion could be drawn that the injury was caused by a gunshot with the projectile ultimately lodging in the right thigh. All skin lesions and the damage to the clothing could be explained by a single shot. First the bullet perforated the sweater and the T-shirt worn directly underneath. Then the projectile grazed a fold of the abdominal wall, left the T-shirt for a short distance and re-entered the abdominal wall after perforating the T-shirt again. From there the bullet passed downward almost vertically through the soft tissue of the extremely thick-layered abdominal walls without entering the abdominal cavity, exited above the right groin and re-entered the directly adjacent thigh. There the projectile lodged without any major deformation. In relation to the body axis the 38 cm long bullet track thus ran approximately vertically in a cranial to caudal direction. The soot soiling of the first and second textile layer demonstrated that the weapon must have been fired from a very short distance (contact or near contact shot).

When the man was asked what caused the defects on the clothing he stated at first that these had been produced by glowing cigarettes some time before. After being confronted with the results of the examination and the contradictions of his version the man admitted that he himself had inflicted the gunshot wound with a revolver, for which he had no permission, while allegedly cleaning the weapon.

The shot was fired from a converted RECK revolver. In the original state this revolver fired round-nosed bullets with a kinetic energy of not more than 7.5 Joule. The original 4 mm barrel had been exchanged for a barrel of

Fig. 2 **a** Fleece sweater with powder soot blackening and thermal damage to the synthetic textile fibers, **b** T-Shirt with 3 defects and powder soot blackening between the upper and middle hole



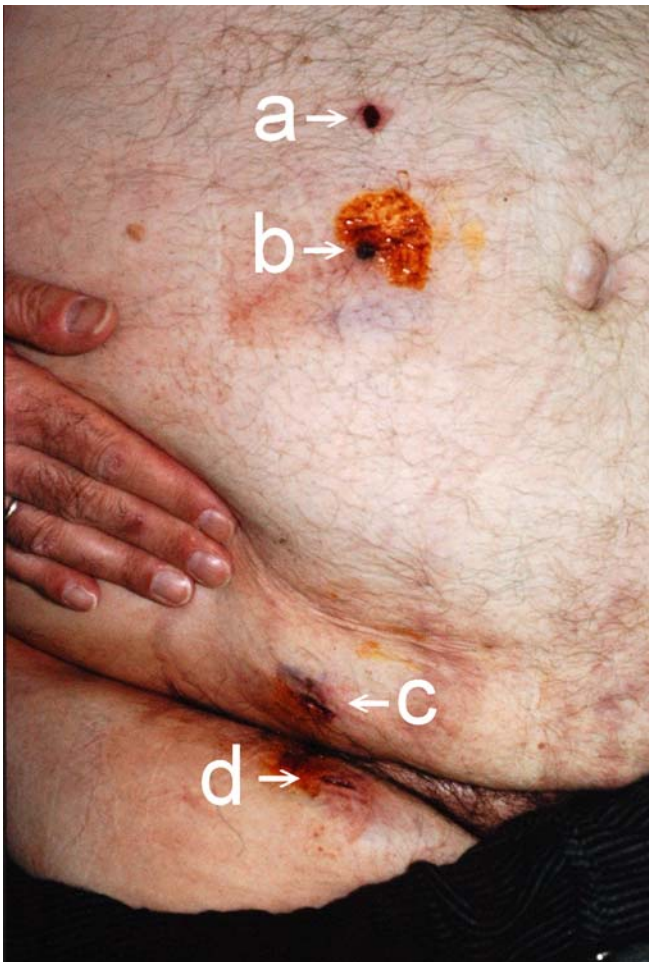


Fig. 3 **a** Abrasion by grazing contact of the bullet, **b** primary entrance wound, **c** exit wound, **d** secondary entrance wound (re-entry)

caliber .22 and the cylinder chambers had been extended accordingly, so that cartridges of caliber .22 long rifle could be fired instead of 4 mm cartridges. In test shots from the weapon an average kinetic energy of 116 Joule was achieved.

Discussion

In our case the accidental self-inflicted wound was suffered by a 50-year-old man with the primary bullet entrance wound being localized in the abdominal region. In the study material of Copeland [1], the age group of 41–50 years accounted for 7.4%. In 51.9% of the cases the injuries were self-inflicted, and in 77.8% handguns had been used. According to several authors [e.g. 1, 9] the abdomen is the third most frequent site of the entrance wound in firearm accidents (after the head and the thorax).

The contribution of medicolegal investigations to the elucidation of accidental firearm injuries has been repeatedly emphasized in the forensic literature [e.g. 3, 6, 11]. The case reported by us also underlines the importance of inspecting the clothing in the course of physical examinations and autopsies [12]. Without the soot deposits on the outer textile layers the diagnosis of a close-range shot would not have been possible.

By presenting this case we wanted to give an example that clinical-forensic examinations can make an essential contribution to the solution of real or doubtful criminal offences [13–15]. In our case the initial allegation of the victim that he had been injured by an unknown person could be disproved by the forensic assessment at an early stage thus avoiding expensive and unnecessarily futile investigations to find a perpetrator.

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