

Unusual findings in a case of suicide with a gas weapon

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Summary. Case report on a suicide with a gas pistol loaded with 8 mm blank cartridges. A 58-year-old male shot himself in the right temple and then in the back of the neck. The contact shot wounds showed large wound cavities with interspersed powder particles. The soft tissues were injured solely by the pressure of the exploding powder. Death was due to an air/gas embolism in the right ventricle of the heart.

Key words: Gas weapons – Starter pistols – Air embolism

Zusammenfassung. Es wird über einen Suizid mit einer Gaspistole berichtet, die mit 8-mm-Platzpatronen geladen war. Der 58-jährige Mann hatte sich zunächst in die Schläfe und anschließend in den Nacken geschossen. Hierbei waren tiefreichende, beschmauchte Wundhöhlen entstanden. Die Weichteile waren alleine durch die explodierenden Gase geschädigt worden. Todesursache war eine Luft/Gasembolie.

Schlüsselwörter: Gaswaffen – Schreckschußwaffen – Luftembolie

Introduction

The danger of shots fired at close range or contact shots with gas weapons and starter pistols loaded with blank cartridges (calibre 8 or 9 mm) is well known [e.g. 3, 6, 10–12]. Most of the reported fatalities due to gas weapons are suicides. In addition to findings normally associated with this type of suicide this case shows an unusual injury pattern which, at first sight, would lead to surprising indications as to the cause of death.

Case history

A 58-year-old male was found by his wife lying dead in the left-sided position on a sofa in his apartment. The face as well as the

head hair were covered with dried blood. There were extensive blood stains around the head and on the pillow and both hands were also covered with blood. There was a wound in the right temple and another wound in the back of the neck where the barrel of a gas pistol (ME 8 Detective, 8 mm) was found inserted approximately 2 cm into this open wound. One used cartridge case was jammed in the cartridge ejector, another used cartridge case was lying under the body on the sofa. There were blood spots spread over the wall behind the sofa covering an area of 170 × 100 cm. There were no signs of a fight and the apartment door was locked. According to his wife and daughter the man had been suffering from depression but a suicide note was not found.

Autopsy findings

On the body, 2 contact shot wounds were found: a cross-shaped rupture wound in the right temple with a wound cavity underneath (Fig. 1). This wound extended as far as the temporal bone, which was not injured. The arachnoidea underneath the temporal bone showed small superficial haemorrhages. The wound also extended to the soft tissues of the cheek, and the mucous membranes of the mouth showed superficial ruptures, petechiae, and haemorrhages near the uvula and in the palate.

The second shot wound was in the middle of the back of the neck (Fig. 2) and 1 cm above this round contact shot wound the skin of the neck was ruptured tangentially for 9 cm. At first sight it looked like a cut but under the operating microscope the margins of this wound were irregular. The barrel of the gas pistol remained inserted in this wound. Within this wound, which was filled with powder soot, the neck muscles were ruptured and the wound cavity extended to the upper cervical vertebral column (Fig. 3). The vertebrae of the neck as well as the skull were not injured. There were small petechiae in the medulla oblongata. The base of the cerebellum (Fig. 4) and the corresponding parts of the dura showed small haemorrhages.

Both injuries were filled with large quantities of interspersed propellant powder particles. Projectiles or metal fragments were not found and the X-ray results were also negative.

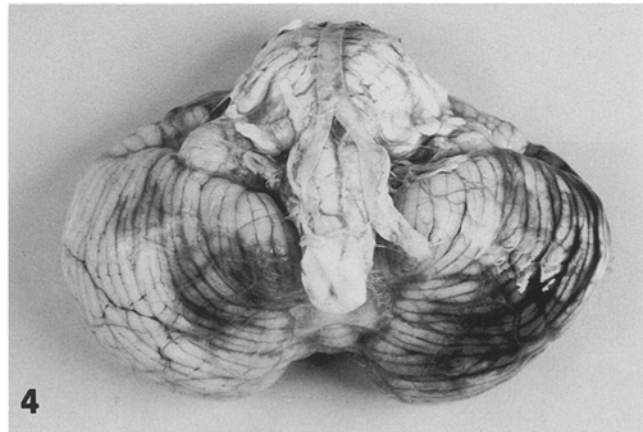
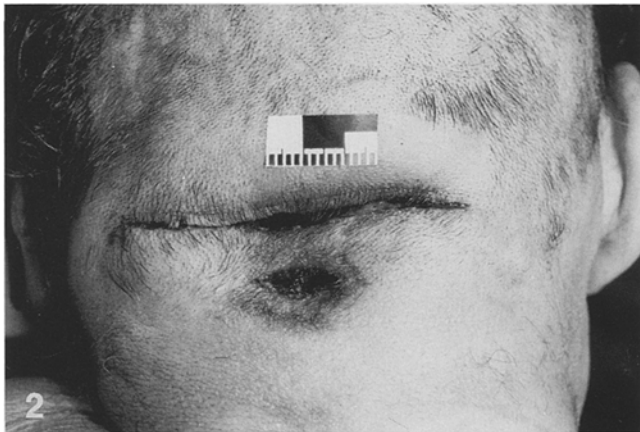


Fig. 1. The right temple with a cross-shaped contact shot wound. Underneath there was a wound cavity reaching down to the temporal bone

Fig. 2. The middle of the back of the neck with a round contact shot wound. Above the skin is ruptured laterally for 9 cm, and the barrel of the gas pistol was found inserted into this wound

Fig. 3. Sagittal cut through the cervical vertebral column with parts of the base of the skull. The upper neck muscles are ruptured in a funnel-shaped manner. In the dura at the foramen magnum there are some petechiae

Fig. 4. The base of the cerebellum with small haemorrhages

Under the microscope both wounds showed no signs of a wound reaction. Together with the findings at the scene this indicated that very little time had elapsed between the first shot and the time of death. As a sign for a moderate loss of blood, the livores mortis showed a nearly regular intensity, and the internal organs were slightly pale. There were gastric contents in the pharynx, the trachea, and some bronchial tubes (terminal aspiration) and the stomach contained 400 ml fluid.

The cause of death was due to an air/gas embolism in the right ventricle of the heart. At the autopsy the thoracic wall was opened and when the pericardium was filled with water, the heart ascended to the surface. The heart was opened with a scalpel in situ under water and many large bubbles were seen to leave the right atrium and ventricle. Due to technical reasons this gas was not measured in quantity or identified by a gas analysis (air?, powder gas?). The source of the air/gas embolism was the many

injured blood vessels within the extended wound cavity in the neck.

The toxicological analysis showed a blood alcohol concentration of 0.74‰; the other toxicological examinations were negative.

Pathology findings of the internal organs were a biventricular hypertrophy of the heart, a fatty degeneration of the liver, a diffuse prostatic enlargement, and hyperplasia of the thyroid gland.

Discussion

The gas pressure of gas or starter weapons usually ranges from 300 to 500 bar [12]. Even without any modification of these weapons and using blank cartridges only, the expanding propellant powder gas is powerful enough to cause penetration of skin, thoracic wall, and even bones [1, 3, 4, 6, 8–13], when the muzzle of the weapon is in contact with the body (contact discharge). The injuries reported in this case resulted solely from the pressure of the exploding powder.

This case shows how powerful the pressure of the exploding propellant powder can be. The shot to the right temple resulted in a wound cavity which reached down to the soft tissues of the cheek, the mucous membranes of the mouth were ruptured and showed petechiae and haemorrhages. The contact shot against the neck caused the soft tissues to burst in such a way, that the skin above the contact wound was torn for some centimeters. Within the large wound cavity the neck muscles were severely ruptured and the pressure of the powder explosion resulted in petechiae in the dura, the medulla oblongata, and the cerebellum.

Obviously in suicide cases with a starter pistol it is not unusual to find two shots to the head. We recently examined a suicide case, where a 33-year-old male had tried to kill himself with 2 contact shots against the right temple with a gas pistol, but failed. Two months later he finally killed himself by injecting an overdose of heroine. At the autopsy there were 2 cross-shaped cicatrices in the temple with interspersed powder particles. The incident with the gas pistol was later reported by the mother of the man.

Although suicidal shots with gas weapons against the temporal regions are not uncommon [e.g. 1, 4, 9, 12], a shot to the back of the neck with a gas pistol has not been previously observed. This fact might be due to the relative rareness of incidents with gas weapons, as suicidal shots in the back of the neck with other weapons have been widely reported [e.g. 2, 5, 7].

Furthermore, the case presented is remarkable because the cause of death was due to the air/gas embolism and

not to the loss of blood as in most other reported cases [1, 4, 9, 12]. In fact, as far as it could be determined, this is the first case with a lethal air embolism due to a shot with a gas weapon, as other case reports could not be found in the German literature. The rareness of air embolism in these cases is surprising because, unlike in cases of shots with projectiles, a temporary wound cavity which could diminish the gas pressure, cannot be found after shots with gas firearms. As a consequence, the transgression of gases under pressure into the many injured blood vessels should occur more often in such cases.

The gas pistol was well as the blank cartridges used in this case were widely available and, according to the expert opinion of police specialists, the weapon and the blank cartridges had not been modified. Due to the fact that the sale of such weapons is more or less unrestricted (the buyer need only be at least 18 years old) under the very rigid German weapon laws, most people equate this fact with the harmlessness of gas weapons.

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