

Suicide by shooting with a tiling hammer

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Abstract Reports of cases involving self-made firearms are rare. This report discusses an unusual case involving a 36-year-old man found dead by the bank of a lake with a suspected gunshot wound. A gas pistol, calibre 9 mm, was found in the lake. A metal pipe with a hammer was also found but not initially identified as the causative weapon. The investigation focussed on the gas pistol until tests revealed that this had never been fired. Attention then turned to the metal tube and hammer. A reconstruction of the weapon revealed that the victim had constructed a unique functional device activated via a hammer used in his occupation as a tiler. It was concluded that the man had committed suicide. This is a highly unusual suicide case due to the discovery of more than one weapon at the scene and the use of a self-made firearm. The findings of this case would be of interest to forensic scientists, pathologists and the police.

Keywords Suicide · Self-made firearm · Gunshot wound · Medico-legal autopsy

Introduction

Suicides caused by firearms account for approximately 11% of all suicides in Western Europe [1]. It is well documented

that a significantly high proportion of these cases happen in occupations such as the armed forces, farming and the police where legal access to firearms and expertise in handling these weapons are more common, mostly involving manufactured firearms [1, 2]. Reports of self-made firearms have become increasingly uncommon in recent years due to commercial firearms being less costly and relatively easy to acquire. Published literature concerning the use of homemade firearms in suicide or homicide attempts consists of a few isolated articles, many of which have been in print for over 10 years [4–10]. Often, possession of atypical firearms is not governed by the same stringent regulations [11]. The case reported here concerns a successful suicide attempt involving fatal thoracic injury inflicted with a homemade firearm.

Case report

A 36-year-old tiler was found dead on the bank of a lake, lying on his back. A wound with surrounding soot, suggestive of a gunshot wound, was apparent on the left side of his chest. A subsequent police search of the area recovered a gas pistol, make Reck Colt Double Eagle, calibre 9 mm PA Knall, from the lake. A homicide investigation was opened against its registered owner. A metal pipe with a self-made handle and a hammer were also recovered from the lake but were not believed at first to be of any significance in the case.

The body was subjected to a medico-legal autopsy at the Institute of Legal Medicine in Hamburg, Germany. At external examination, a shot entrance wound to the left anterior chest with extensive surrounding soot stains was found. On closer examination, the wound showed mild irregular abrasions in the margins but lacked the characteristic features of a contact range entrance wound. An exit

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wound was not found. A subsequent X-ray examination revealed a large projectile in the left posterior chest wall.

On internal examination, the wound channel was found to enter the chest cavity through the cartilage of the left sixth rib, continuing through the right cardiac ventricle, the diaphragm, the liver, the stomach and the spleen. Finally, the tenth rib was penetrated in the medial scapular line, and a projectile with a diameter of about 12 mm was recovered from the subcutaneous fat of the posterior chest wall. The cause of death was a gunshot wound to the chest.

The morphology of the entrance wound and the size of the projectile were not consistent with use of the gas pistol. This was later confirmed by scientific examination of the gun, which showed that it had never been fired. Only at this point were the metal pipe and the tiling hammer examined.

The metal pipe was found to be 277 mm in length, weighing 165 g, and the calibre was approximately 45 Colt. The inner diameter was between 12.7 and 13.1 mm, and the metal was between 1.7- and 1.8-mm thick. The handle of this device was made from synthetic sticky tape. The projectile used was a full metal jacket lead projectile, calibre 45 Colt. The hammer was found to be a tiling hammer with a blunt end and a hardened tip.

Further investigations demonstrated that a shot had been fired from the metal pipe, the composite of the powder residues matching those found on the body. Matching residues were also found on the hardened tip of the tiling hammer. Further research revealed that it is common practise for tilers to drive bolts into walls by loading them into a tube fitted with a percussion cap at one end and using a hammer to fire the bolt. In order to assess the velocity and energy created by a projectile fired in this way, a reconstruc-

tion was carried out by the Hamburg State Office of Criminal Investigation (LKA 36). For this purpose, the metal tube was mounted onto a frame and the hammer was suspended on a pivotable mount so that it could be released from a distance to trigger the shot (Fig. 1). It was found that, by using a projectile like the one recovered from the body, the projectile velocity, as measured at 2 cm away from the muzzle, reached 90.83 m/s and had 68.47 J energy.

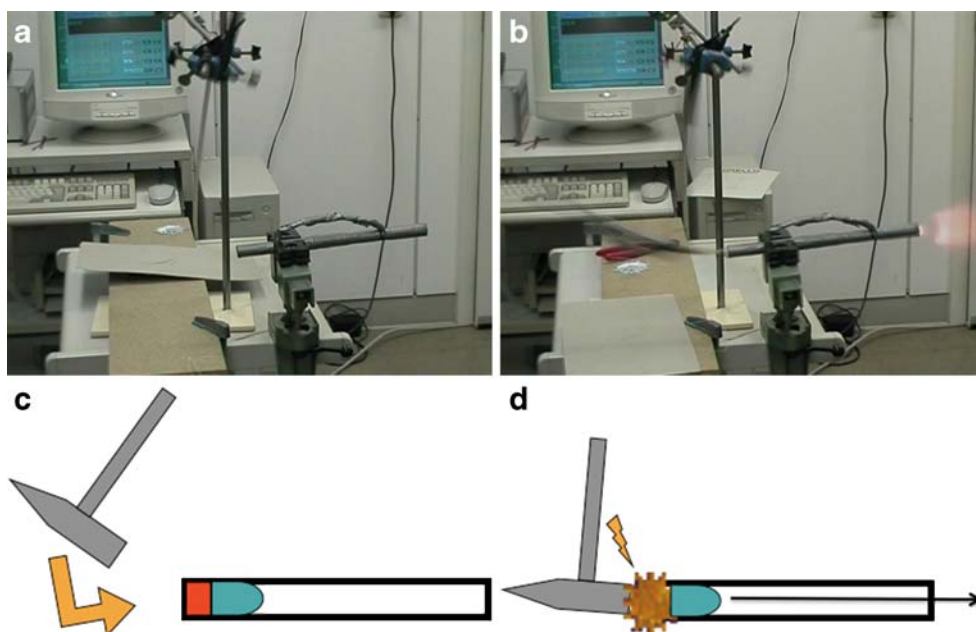
In view of the case history, the autopsy and experimental findings, it was concluded that the self-made device had been used by the tiler to shoot himself in the chest. The manner of death was, therefore, decided to be suicide.

Discussion

We present an unconventional case of a suicide involving a self-made firearm. The case in question highlights key problems that could occur during the investigation of firearm deaths. The most salient of these will be discussed briefly, with reference to the existing literature.

Considering the unusual nature of the present case, the body of literature concerning similar cases is understandably small. However, some of the forensic aspects of the case have been discussed before. Several studies have confirmed easy access to firearms, including occupations with specialist knowledge in their use, as a contributing factor in firearm-related suicides [1–3, 5, 7, 12–15]. As other studies have indicated [16], there may be several compounding factors that may also account for international variations in firearm deaths, such as cultural and economic differences.

Fig. 1 Experimental reconstruction of the shot. **a** Before the shot, **b** sketch of **a**, **c** during the shot, **d** sketch of **c**



Aspects of the firearm used in this case were specific and unique to the victim's occupation as a tiler. This case is, therefore, consistent with the cases previously reported and highlights an important issue: the nature of the firearm may provide important information about the occupation and identity of those involved with its use.

The homemade firearm was initially identified as a 'metal tube' of no forensic significance, and investigations centred on a gas pistol which was also found at the scene. Initial misidentification of self-made weapons, due to their atypical or innocuous appearance, has been reported previously [17]. This potential problem highlights the value of conducting an extensive scene investigation, with an open mind, in cases involving self-made firearms, as the most likely version of events is not always the correct one and further investigation may be needed.

A detailed analysis led to the conclusion that the wounds present on the victim were not consistent with infliction by the gas pistol found. Later tests confirmed that the pistol had never been fired. Attention then turned to the 'metal tube'. The components used to make the firearm were analysed and experiments were conducted to reconstruct the homemade firearm and release shots from it. This revealed that this device had been used in the present case and that it was possible to create the energy and projectile velocity necessary to penetrate the chest in a manner consistent with the victim's wound channel. More recent publications have suggested a CT-based approach for the ballistic analysis in firearm deaths [18].

Homicide may first be suspected in firearm deaths if the homemade weapon is not found, if the entrance wound suggests a far-range shot or, as recently reported [19], if multiple entrance wounds are present, requiring a prolonged action ability.

Vital conclusions in the present case were only achieved by the close cooperation of forensic pathology and the police services; this once more highlights the overriding importance of an interdisciplinary approach in the investigation of firearm deaths [17, 20].

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