

CASE REPORT

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An Atypical Gunshot Wound from a Home-Made Zip Gun—The Value of a Thorough Scene Investigation*

ABSTRACT: Zip guns and the atypical gunshot wounds they produce are rare in forensic pathology. Because of this, investigators and forensic pathologists may be unfamiliar with their construction, appearance, and the wounds associated with them. A 43-year-old mechanic, with a history of depression was found dead in a washroom stall at work with an atypical gunshot wound of the head. Upon initial investigation, no weapon was found at the scene. Due to the nature of the scene, and the unusual characteristics of the wound, the manner of death was at first thought to be a homicide. Subsequently, a simple zip gun, which had been overlooked during the scene investigation, was discovered by a co-worker while he was cleaning the stall. Examination of the wound revealed evidence of contact range firing. A markedly deformed bullet was recovered from the head, consistent with the use of the home-made gun. These findings, along with further police investigation and review of the past medical history, indicated that the manner of death was a suicide.

KEYWORDS: forensic science, zip gun, scene investigation, atypical gunshot wound

A “zip gun” is defined as a crude home-made firearm, or the conversion of a blank pistol, tear gas gun, or cap pistol to a firearm (1). In the United States, zip guns were popular in the 1950s in predominantly urban areas, since they were easy to manufacture from cheap, commonly available materials. However, because of the crude construction of the weapon, they could only fire projectiles at low velocity, had limited accuracy, and commonly misfired, making them suitable for short range use only. Today, commercially available well-manufactured firearms are relatively inexpensive and simple to acquire, making zip guns almost obsolete. Zip guns are still occasionally encountered in cases where the subject has some mechanical knowledge and the necessary parts are readily available, as in this case, or where the subject is unable to purchase a gun.

Case Report

A 43-year-old automobile mechanic with a history of depression and alcoholism was found dead at work in a washroom stall, slumped backwards across the toilet seat and leaning against the back wall. The right arm was hanging down, and resting upon the floor. A single atypical gunshot wound was evident on the forehead, and the right arm and hand were covered with dried blood spatter. A claw hammer was observed lying in a pool of blood on the floor next to the deceased’s right arm.

The deceased’s history of depression and alcoholism strongly suggested that the wound was self-inflicted. However, no firearm was found at the scene during the initial investigation. Two possibilities were considered; firstly that the gun had been removed from the scene prior to the investigators’ arrival, and secondly, that the case was actually a homicide.

Autopsy revealed an atypical lacerated contact gunshot wound of the forehead, 0.5 × 0.6 inches (Fig. 1). There was searing of the wound edges, and abundant soot was present within the wound. However, no muzzle imprint was observed. Purple contusion surrounded the skin adjacent to the wound. The wound course involved the frontal bone of the skull, the frontal lobes of the brain in the midline, the midbrain and pons, the right cerebellar hemisphere, and the occipital bone of the skull. Finally, a medium caliber, markedly deformed lead bullet was recovered from the right posterior scalp. No rifling marks were seen on the bullet. The case was not finalized that day, and further police investigation was requested.

Subsequently, interviews with the deceased’s family were conducted. The deceased had been moody and feeling despondent since he quit drinking in the 2 months prior to his death.

During the investigation, an employee of the auto shop was cleaning the washroom where the deceased had been found, and discovered an air-hose nozzle with an attached connector lying on the floor of the stall. He cleaned the implement and placed it on his workstation table, thinking he would find a use for it later (Fig. 2). The employee informed the deceased’s brother of his discovery, and the brother then showed it to the police officers involved with the case.

Upon close inspection, a nail was seen protruding from the air-hose nozzle. The device was disassembled by crime laboratory personnel, revealing it to be a crude zip gun that had been constructed from a 2-inch length of pipe, a 1 $\frac{3}{4}$ inch connector, an air hose nozzle and a 2-inch nail (Fig. 3). A CCI NR .38 special cartridge case was found embedded within the pipe.

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FIG. 1—Atypical contact gunshot wound of the forehead.



FIG. 2—Zip gun on employee's workstation, located in center of photograph.

Closer inspection of the original scene photographs revealed this zip gun lying next to the deceased's right hand (Fig. 4). The small size and the innocuous appearance of the unrecognized weapon resulted in its being overlooked during the initial scene investigation.

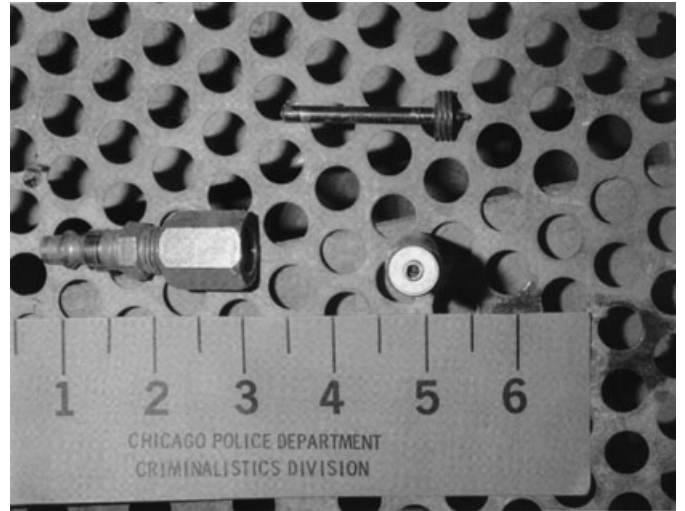


FIG. 3—Disassembled zip gun.



FIG. 4—Initial scene picture with location of zip gun and hammer highlighted. Inset with large arrow: zip gun. Arrowhead: location of hammer.

It was concluded that the deceased had placed the zip gun against his forehead and struck the protruding nail with the hammer also found at the scene. The nail was then driven into the primer of the .38 cartridge lodged in the pipe, causing it to fire. The cause of death was from a gunshot wound of the head, and the manner of death determined to be suicide.

Discussion

Zip guns were popular in poor inner city areas in the 1950s, since they were easy to manufacture from commonly available materials. Some were made by individuals working alone, while others were constructed in school metal workshops (2). Frequently, they were fashioned from a piece of wood, a metal barrel such as a car antenna, and a firing pin made from a nail.

The necessary components required to make a zip gun are a chamber with or without a barrel, a hammer, and a crude frame. Finally, a source of energy is needed to operate the firing pin, for example, a rubber band.

The simplest zip guns consist of a metal pipe with a cartridge inserted at one end. To fire the weapon, the protruding cartridge base is struck with another object such as a hammer. Blank firing pistols and toy cap pistols are relatively easy to obtain, and can be readily converted to fire live ammunition (3). The cap pistol already has the entire firing action, and only needs minor modifications for it to fire .22 rim fire cartridges.

However, blank pistols require boring out of the narrow distal part of the barrel, or alternatively the end of the barrel is cut off just proximal to the narrowed portion. In these modified weapons, the crudely widened barrel diameter is not constant along its length. Frequently, the diameter of the bullet is smaller than the barrel, leading to tumbling, low velocity, and instability of the bullet. As a result, these weapons are only suitable for short range use (3).

Pen guns still retain some popularity due to their innocuous appearance and portability. However, they can be extremely dangerous to inexperienced handlers because of the inapparent nature of the weapon on cursory inspection.

An accidental death from a pen gun conversion has been described (4). In this case, an auction company worker making an inventory of items in a tool chest accidentally shot himself with a writing pen gun which utilized a spring-loaded firing mechanism.

Wounds produced by zip guns often have an irregular, atypical appearance. Instability and tumbling of the bullet when it leaves the gun is due to a poor fit inside the barrel, and lack of rifling. The bullet may be deformed and partially flattened by skidding along the barrel. Bullet tumbling may result in the bullet impacting the target side-on. In addition, an unusual gunpowder distribution may be present about the wound (5). All of these factors contribute to the atypical entrance wound seen with these weapons. Powder deposits may be observed on the hand holding the weapon, since the gap between the bullet and the chamber is so wide (3). In some cases, where the barrel and cylinder are a poor fit, fragments of lead shaved off the bullet as it passes from the cylinder to the barrel may become embedded in the skin of the shooter's hand (3).

Projectiles that have been used in zip guns include marbles, tacks, ball bearings, BB pellets, needles, and regular bullets (3). The latter are often .22 caliber. A propellant is also necessary, and this may consist of powder from match heads, or fulminate from toy cap disks and firecrackers.

Today, cases involving zip guns are rarely seen, due to commercial firearms being less costly and easy to acquire. Occasional cases are seen where the zip gun maker is a gun enthusiast, where materials to make the gun are readily available, or in populations where

possession of weapons is prohibited, for example in prisons, or countries such as South Africa (6).

With the advent of the Internet, multiple discussion groups and online resources are available to the gun hobbyist interested in zip guns. Some of these include detailed descriptions of how to assemble a simple pen gun that will fire small caliber ammunition. Many sites also have a "shopping list" of the required parts (7,8).

In our case, the decedent had the mechanical knowledge and ready access to parts needed to construct a zip gun. The atypical entrance wound and deformed bullet recovered from the head without evidence of rifling marks are typical findings associated with zip gun use.

This case illustrates the value of a thorough scene investigation when investigating deaths involving an atypical weapon of this nature. Detailed documentation of the scene, follow-up interviews with witnesses, recognition of the zip gun, and correlation with the atypical wound found at autopsy, aided in the accurate determination of the cause and manner of death.

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References

1. DiMaio VJM. Gunshot wounds. Practical aspects of firearms, ballistics and forensic techniques. 2nd ed. Boca Raton, FL: CRC Press, 1999.
2. Koffler BB. Zip guns and crude conversions—identifying characteristics and problems. Part 1. *J Crim Law Criminol Police Sci* 1969;60(4):520–31.
3. Koffler BB. Zip guns and crude conversions—identifying characteristics and problems. Part 2. *J Crim Law Criminol Police Sci* 1970;61:115–25.
4. Hartshorne NJ, Reay DT, Harruff RC. Accidental firearm fatality involving a hand-crafted pen gun. *Am J Forensic Med Pathol* 1997;18(1):92–5.
5. Hiss J, Shoshani E, Zaitsev K, Giverts P, Kahana T. Self-inflicted gunshot wound caused by a home-made gun—medicolegal and ballistic examination. *J Clin Forensic Med* 2003;10(3):165–8.
6. Book RG, Botha JB. Zulu zip-guns and an unusual murder. *Am J Forensic Med Pathol* 1994;15(4):319–24.
7. <http://textfiles.com/anarchy/zip.gun>
8. Man-Tooth. Homemade guns. <http://www.phrack.org/issues.html?issue=2&id=3> <http://www.phrack.org>.

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