

CASE REPORT

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Case of the Homemade Duplex (Double-Bullet) Cartridge

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ABSTRACT: Multibullet cartridges are used to create the salvo effect with increased hit probability and wounding capacity. These cartridges are not new; however, until recently, their usage has been confined to the military. The following report is the first published case concerning homemade duplex (double-bullet) cartridges manufactured in the Greater Miami area. When gunshot wound entrance and exit sites do not add up, multibullet cartridges must be considered.

KEYWORDS: criminalistics, ballistics, wound ballistics

A metallic duplex (double-bullet) cartridge is one of a variety of multibullet cartridges that have been available after the development of the self-contained metallic cartridge in the middle of the nineteenth century [1]. One of the early prototypes was the R. W. Scott multiball cartridge tested during the year 1900 [2]. The advantage of the multibullet or multiconical projectile cartridge is to create a salvo effect or the simultaneous firing of more than one projectile at a target, that is, mimicking a buckshot cartridge. This multiple wounding capacity, as well as the projectile dispersion with increased hit probability, has obvious military implications. In fact, there have been several such multibullet cartridges tested or utilized or both including the 7.62 NATO (.30 caliber) load and the more sophisticated salvo squeeze bore [2-6]. Quad ammo, which consists of four conical projectiles per cartridge, has had a surge of interest in recent years and is considered of interest for police and civilian usage [7,8]. The ammunition is lethal at short ranges and increases the probability of a hit because of dispersion of the projectiles. The absence of excessive penetration is also a desirable feature for both the homeowner and police SWAT team for whom the protection of other inhabitants of the home and nearby fellow police officers are important considerations.

Multiprojectile paper cartridges such as the "buck and ball" were available since and possibly before the American Revolution [9]. Thus, the salvo effect is not a new idea since the first self-containing paper cartridge was developed in 1635 by King Gustavus Adolphus of Sweden [10].

The following report is that of a civilian homicide in which homemade duplex cartridges

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were used. This is the first published case where this particular ammunition resulted in death and is a reminder that multibullet ammunition must be considered whenever the entrance and exit sites do not add up during the forensic autopsy. The duplex cartridge should not be confused with the term "piggyback" bullet. The latter represents a misfire whereby the retained bullet within the gun barrel is pushed out by a new discharge thereby resulting in two bullets leaving the firearms at the same time [11-17].

Case Report

A security guard at a Miami area lounge killed a gun-wielding patron. In accordance with Florida Statute 406 which mandates medical examiner investigation of sudden and unexpected death, the body was brought to the Dade County Medical Examiner Department for autopsy.

External examination revealed two penetrating gunshot wounds to the head. In the trunk there were five entrance wounds and one exit. X-ray of the trunk revealed four projectiles plus small pellets consistent with a snakeshot load. Since an exit wound was identified on the trunk, there should have been six entrance sites to tally with the number of missiles and the exit wound; thus, a discrepancy arose. Internal examination revealed that two entrance wounds were associated with three bullets. The remainder of the wound tracks including the exit wound were easily explained. Both sites of projectile entry had the standard appearance of an entrance gunshot wound.

The first entrance wound was located on the upper right side of the chest 18 cm (7¼ in.) below the level of the shoulders and 4 cm (1⅔ in.) to the right of the midline. The pathway extended through the underlying sixth rib, the right pleural cavity with perforation of the right middle lobe, and finally into the soft tissue external to the right side of the rib cage. The second entrance wound is located on the left side of the trunk within the upper portion of the left posterior axillary line 20 cm (8 in.) from the top of the shoulders. The pathway extended into the left pleural cavity with perforation of the left upper lobe, the prevertebral soft tissue posterior to the aorta and anterior to the thoracic vertebrae, and then through the right pleural cavity with perforation of the right lung. The pathway then continued into the soft tissue external to the right side of the rib cage.

Three lead alloy projectiles were found on the right side of the trunk in the vicinity of each other. One of the projectiles was found within the soft tissues of the right side of the back at a site 23 cm (9 in.) to the right of the midline and 13 cm (5 in.) below the level of the shoulders. The second projectile was found within the soft tissue just inferior to the junction of the humerus with the scapula. The third projectile was located under the skin of the posterolateral aspect of the trunk 23 cm (9 in.) below the level of the shoulders and 21 cm (8¼ in.) to the right of the midline. Since there were two entrance sites for three projectiles, a piggyback bullet was considered a strong possibility. The probability of a double entrance site as a result of machine gun fire seemed remote in the absence of statements supporting the usage of such a firearm.

The security guard was later interrogated by the police and it was determined that duplex (double-bullet) cartridges were used and are available from a Miami based producer. The security guard refused to reveal the name of the manufacturer and it was also learned that this ammunition is not commercially available.

The three projectiles in question were roughly cylindrical and convex at both ends (Fig. 1). Although mutilation prevented any accurate determination of diameter, the rifled surfaces were consistent with having been fired in a .38 caliber weapon with five-groove rifling, right-hand twist. Remaining weights of the projectiles were 73.6, 73.9, and 77.5 grains. Scene investigation indicated that these projectiles were probably fired in a .357 Magnum Ruger Security Six revolver, which was impounded and submitted to the laboratory for examination. Insufficient detail was present on these projectiles, however, to permit any conclusive deter-

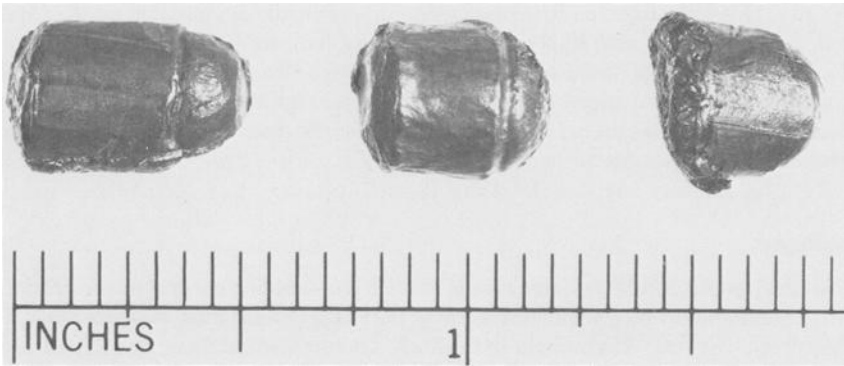


FIG. 1—The three lead alloy projectiles found in the body were roughly cylindrical and convex at both ends. 1 in. = 25.4 mm.

minations. Communication with Messrs. James Hamby (Illinois Department of Law Enforcement, Joliet, IL) and George Kass (Forensic Ammunition Service, Spring Arbor, MI) produced no reports of current commercially available handgun ammunition with duplex loads.

Subsequent investigation produced two .357 Magnum cartridges of the type allegedly used. Disassembly of one of the rounds showed two stacked projectiles, with the space between taken up by a black bullet lubricant (Fig. 2). Each projectile weighed approximately 78 grains, producing a combined load of a nominal 158 grains. The individual projectiles appear to have been swaged as oversized balls or oblongs, then forced through a lubricator/sizer in pairs. The charge was about grains of disk powder, probably Hercules Unique (Hercules Powder Co., Wilmington, DE).

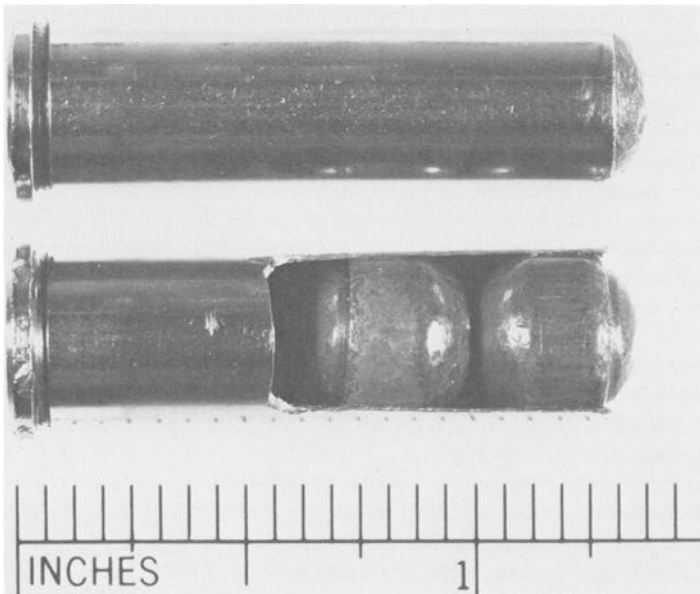


FIG. 2—Disassembly of round of .357 magnum cartridge showing two stacked projectiles, with the space between taken up by a black bullet lubricant. 1 in. = 25.4 mm.

Comment

In the absence of sufficient cartridges available for test firing, the expectations for projectile dispersion are not known. The duplex bullets from one of the discharged cartridges separated such that only one of the bullets struck the victim. The other bullet missed the target but it is not known to what degree or from what distance. Theoretically, the separation distance would not be large and therefore the double wounding capacity of this type of ammunition is quite evident. The other discharge did not result in pretarget separation; however, both projectiles entered the body simultaneously and later separated into different paths within the body. Since the separation occurred after perforation of vital organs, this factor was not significant in this case. Nevertheless, an earlier separation upon impact with the skin could have created more devastating effects.

With the more widespread usage of the duplex cartridge and the new Quad ammo, we expect to see more of this type of wounding pattern. The forensic pathologist must consider the possibility of multibullet ammunition whenever entrance and exit sites do not add up. X-rays are valuable to find the extra bullet; however, the possibility of the residual projectile from an old gunshot wound must also be considered. When the problem of unknown ammunition is combined with gunshot wounds that do not add up, the equation of $1 + 1 = 3$ must be solved by the autopsy with, hopefully, the subsequent identification of the ammunition.

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