

CASE REPORT

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Unique Aspects of a New, Hand-Reloadable Ammunition

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ABSTRACT: The unique shape and ballistics aspects of a new variety of hand-reloadable ammunition manufactured by the United States Ammunition Co. are described. The thin copper plating of the projectiles will usually be lost after the weapon is fired. As a result, specific rifling marks will usually be lost, making identification difficult. The medical examiner should be aware of the implications of finding these projectiles during death investigations.

KEYWORDS: criminalistics, ballistics, ammunition

A glance at any of the many popular sport and gun magazines will quickly convince the medical examiner that new developments and new configurations in ammunition and weapons are growing as fast as the medical literature. It is not necessary for the forensic pathologist to keep abreast of these newer developments because most produce no great differences in the wounding patterns. Occasionally, however, a new ammunition is produced that deserves attention because it may affect the medical examiner's ability to render a complete forensic report in cases involving gunshot wounds. A plastic-cased, hand-reloadable ammunition manufactured by United States Ammunition Co. (USAC) is such an ammunition. Its unique bullet configuration and potentially unique forensic ballistic characteristics make it an ammunition that the medical examiner should be able to recognize at the autopsy table.

Reloading ammunition is a popular activity among shooting enthusiasts because it is economical and is said to be a pleasurable hobby. Most reloading is done using brass casings and requires both skill and a certain investment in equipment. The primary complication in this activity is the need to resize the fired casing to fit the new bullet. The USAC ammunition described here circumvents this problem by using a plastic casing that has been formulated to "remember" its original size after it has been subjected to the expanding forces of firing. This casing expands, but then over a period of several

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days, it returns spontaneously to its original size. If the shooter desires to reload sooner than that, the casing can be restored to size by heating it to 215°F (102°C) for 10 min. The components of this ammunition are shown in Fig. 1.

The next step in the reloading process is replacing the primer. This requires a tool to extract the spent primer and another tool to insert the new primer. The proper load of powder is then placed into the casing, and a new bullet is pressed into the casing. This is done easily by hand.

This ammunition is said to be inexpensive when used in this manner, although the use of aluminum-cased ammunition is equally inexpensive. The USAC organization clearly states that it considers this ammunition useful only for target practice and that it is not to be used for self-protection or hunting purposes. Nevertheless, as the following two cases indicate, it can result in death.

Case 1

A 38-year-old Hispanic male was the first victim of a homicide involving the use of this ammunition in Dade County, Florida. He was found shot in a park in Miami, and was dead at the scene.

At postmortem examination, he was noted to be clothed. An unremarkable medium-caliber gunshot wound was noted over the left lower quadrant of the abdomen. The wound was not associated with soot or stippling. X-ray examination revealed only a nonfragmented projectile lodged in the pelvis. No jacketing material was demonstrated on the X-ray. The projectile had entered the peritoneal cavity and had passed through the left iliac vessels before coming to rest in the soft tissues of the posterior pelvic wall. The abdominal cavity contained 2500 cc of clotted and nonclotted blood.

No suspect has been identified, and the motive of the homicide is unknown.

Case 2

In March 1988, in Ft. Myers, Florida, an 18-year-old man was involved in a domestic dispute with his 54-year-old landlord. During this altercation the older man, who had a history of severe atherosclerotic heart disease, was knocked down several times before

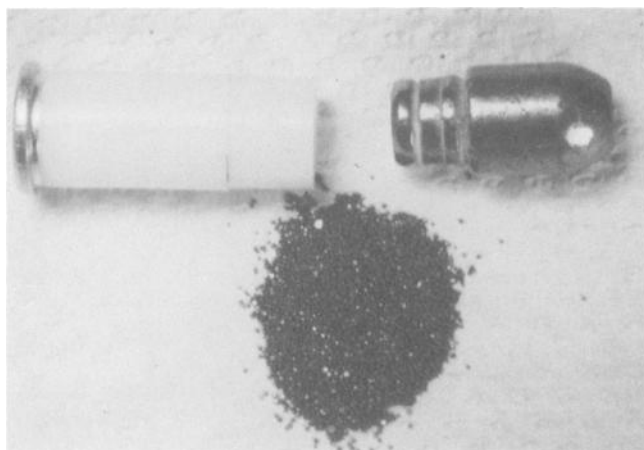


FIG. 1—Components of the plastic-cased, hand-reloadable ammunition (USAC).

pulling a .38 caliber revolver and firing a single shot. The deceased collapsed and was dead upon arrival at a local hospital.

Postmortem examination disclosed an entrance gunshot wound on the left side of his chest with a surrounding finely dispersed pattern of stippling; the wound perforated the deceased's heart (the left and right ventricles) as well as his liver. A projectile was recovered just beneath the skin on his right side. This appeared to be a moderately deformed, medium-caliber, thickly coated, copper-colored, metal alloy projectile, which measured 18 mm in length and 9 mm in maximum diameter. The basal 6 mm of the projectile was only 7 mm in diameter and had two deep and one shallow circumferential grooves. The nose had a semi-wad cutter configuration, with a flattened tip and rounded, tapering shoulders. The coating had peeled off in several areas.

Discussion

This ammunition is available in .38 caliber, .44 caliber, and .45 caliber sizes [1]. This discussion will be limited to the .38 caliber variety.

The medical examiner will immediately recognize these bullets as unique (Fig. 2). They are unusual in two features. The first and most obvious is the unusual shape—no other projectile is similarly shaped. The nose of the bullet is in a wad cutter (flattened nose), semi-wad cutter (partially tapered but flattened nose), or classic round-nose configuration. The base of the bullet, however, is very distinctive in that it is of a smaller diameter than the body of the bullet. The base has three circumferential grooves and ridges that match similar circumferential ridges on the inside of the open end of the plastic case. These grooves and ridges provide a seal between the case and bullet and likewise permit the hand-reloading capability of the ammunition.

Second, the bullets are surrounded by what appears to be a full metal jacket. In fact, the manufacturer advertises these as full-metal-jacketed projectiles. However, the covering of these solid lead cores is a copper plating that is less than one sixth the thickness of the standard metal jacket. The usual copper jacket is approximately 20/1000ths of an inch (0.5 mm) thick, whereas the copper plate on the USAC ammunition is 3/1000ths of an inch thick (0.08 mm) [2].

The importance of this copper plating becomes apparent on examination of the fired bullets recovered from the two cases presented. Both of these showed extensive loss of the plating from around the body of the bullets. The examiner's first thought was that this plating had been stripped from the bullet within the body, just as a standard metal jacket frequently does. However, X-rays and complete postmortem examinations failed to demonstrate any jacketing. This becomes a critical point if a specific weapon match using rifling marks is to be achieved. The lead core underlying the stripped copper plate



FIG. 2—USAC .38 caliber ammunition.

retains the marking for lands and grooves but does not retain any specific rifling that would permit a weapon match.

To further elucidate this problem, test firings of purchased semi-wad cutter .38 caliber USAC ammunition were performed. These firings were into both a water tank and a standard cotton-filled ballistic tube using a variety of .38 caliber weapons. In some cases, the fired bullets lose their copper plating after leaving the end of the barrel. In some of these cases, the stripped copper plating was recovered from the water tank. Therefore, the loss of the copper plate was a result of friction and damage incurred in being fired from the gun and was not a result of the forces of impact on the target. In the homicides described, the copper plating was lost after the bullet left the end of the barrel and before it entered the body.

In other cases, depending on the weapon used, the copper plating was damaged but remained on the bullet. Specific rifling marks were easily seen on these bullets. Because of the fragility and thinness of the copper plating, the medical examiner must be especially careful in removing these bullets from the bodies of victims if rifling marks are to be preserved. Attempts at demonstrating the thin copper plating by radiograph have been unsuccessful.

The two bullets removed from the homicides showed a lack of deformity. This led us to review the velocity and muzzle energy levels attained with this ammunition. Although the manufacturer advertises muzzle velocities of approximately 750 ft/s (229 m/s), when using Bullseye powder and a 7.5-in. (190 mm) test barrel, other tests done by an independent reviewer showed the much lower velocities of about 550 ft/s (168 m/s) [2]. These velocities and energy levels are considerably lower than those seen using more conventional .38 special ammunition [3].

These lower velocities and energies explain the lack of deformity seen in the two cases presented. It should be noted that in the first case, the bullet impacted onto the bony pelvis but was still undeformed. Given these lower velocities, one can expect fewer of these bullets to exit. The associated lower energy levels will be responsible for less tissue injury as a result of shorter penetration and smaller temporary cavity formation. Also, the accuracy of this ammunition can be expected to be degraded as a result of its lower velocity.

Inspection of the fired plastic casings showed that burning and other perhaps unique markings are observed on the outside of the casing. It postulated that the observant ballistics examiner may be able to use these marks to advantage in investigating a case.

The USAC organization manufactures approximately 200 000 rounds of ammunition each month. These are being shipped largely to Florida, Pennsylvania, California, Texas, and New Jersey. Residents of Florida are the leading purchasers of this ammunition. Twenty-five percent of the purchases are to law-enforcement agencies which are using the ammunition for training purposes, including three Federal agencies and six to ten local police departments. The California Highway Patrol has begun using dummy rounds (having no powder or primer) in training in speed loading.³

The private purchaser is either a "plinker" who buys the ammunition for target practice or a person who never intends to reload the ammunition and will simply discard the spent casings. These persons buy it because of its low cost. Others, however, are reloading the ammunition as intended. Thus, it would seem two classes of persons would be expected to have this ammunition: the person who wants ammunition as cheap as possible for his .38 or .45, with no intention for using it for target practice, and the person who is a serious target shooter. This information may be helpful in investigation of homicides involving this ammunition.

³Hutching, M., United States Ammunition Company, Tacoma, WA, personal communication, Jan. 1989.

In summary, the medical examiner should be aware of this ammunition because of its unique shape, the unusual copper plating of the bullets, and the possible implications the discovery of this ammunition may have on investigations of homicides.

References

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