

CASE REPORT

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Wounding Characteristics of Glaser Safety Ammunition: A Report of Three Cases

REFERENCE: de Roux SJ, Prendergast NC, Tamburri R. Wounding characteristics of Glaser safety ammunition: a report of three cases. *J Forensic Sci* 2001;46(1):160–164.

ABSTRACT: Handgun ammunition that contains multiple pellets (birdshot) comes in two forms. We describe here the autopsy and radiographic findings in three individuals who were fatally wounded with Glaser safety ammunition and contrast the findings to those reported in shot shell injuries.

KEYWORDS: forensic science, forensic pathology, gunshot wounds, Glaser ammunition, pellet ammunition, wound ballistics, ballistics

The Glaser safety slug is a type of pellet-containing handgun ammunition. The wounding capabilities of this round are far superior to that of shotshell ammunition with which it may be confused at forensic autopsy. We compare differences in anatomy between the two forms of ammunition and contrast the radiographic and autopsy findings between fatal injuries due to Glaser safety ammunition and shotshell cartridges.

Report of Cases

Case 1—This 47-year-old woman committed suicide using a .380 semi-automatic handgun. A perforation was present in the soft palate, with surrounding soot. There were multiple associated lacerations, abrasions and contusions of the lips, buccal mucosa and tongue. The projectile perforated the base of the skull where there was an associated hinge type fracture of the middle cranial fossa. An additional fracture radiated from the right middle cranial fossa to the occipital bone. There was extensive damage of the brainstem, cerebral and cerebellar hemispheres. There were numerous individual, hemorrhagic wound tracks in these areas. Four fragments of copper jacketing, numerous small pellets and a portion of grey plastic were found in the cranial cavity.

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Received 3 Dec. 1999; and in revised form 28 Feb. 2000; accepted 29 Feb. 2000.

Case 2—This 17-year-old man was shot twice in the head. One bullet entered just posterior to the right external auditory meatus. There was associated soot and stippling around the wound. The projectile perforated the mastoid and petrous temporal bones, leaving a markedly deformed copper jacket and numerous small pellets within. The second wound entered just posterior to the right ear. Soot and fragments of gunpowder were found along the wound tract. The bullet perforated the mastoid bone and entered the cranial cavity. There were extensive lacerated perforations of the brainstem, cerebral and cerebellar hemispheres, with multiple, hemorrhagic wound tracks as well. There were also multiple cortical contusions of the temporal lobes. A markedly deformed copper jacket was found in the cerebrum, along with numerous small pellets along the wound path. Blue plastic material was also recovered.

Case 3—This 30-year-old man was found hog tied in a car trunk. There were early putrefactive changes. There were two entry gunshot wounds of the upper left back, having pierced his clothing on which there was no gunshot residue. There was no gunshot residue or stippling around the entry wounds. One of them perforated the left scapula with associated extensive damage to the subclavian vessels. Portions of .38 caliber copper jacketing, numerous pellets and fragments of blue plastic were recovered along the wound path. There were two small exit wounds in the front of the left torso. A portion of copper jacketing was recovered in the front of his jacket. The second bullet fractured two left ribs and then perforated the diaphragm and stomach. Portions of .38 caliber copper jacketing, numerous pellets and fragments of blue plastic were recovered along the wound path and in his stomach.

Discussion

There are two types of handgun ammunition that contain multiple small pellets (birdshot). The Glaser safety bullet is composed of a special thin-walled copper jacket, filled with pellets (rather than a solid core) and capped with plastic. As in conventional handgun ammunition, the projectile sits in the cartridge casing, above the powder load (Fig. 1a and 1b). Shot shell cartridges have numerous pellets in the cartridge casing, above the powder charge, with intervening wadding. The pellets are then secured in place either by crimping the end of the cartridge casing over the shot or encasing the shot within a plastic cylinder (Fig. 2a and 2b). There are several reports in the literature describing the injuries from shot shell cartridges (1–4). We were unable to find any reports in the literature

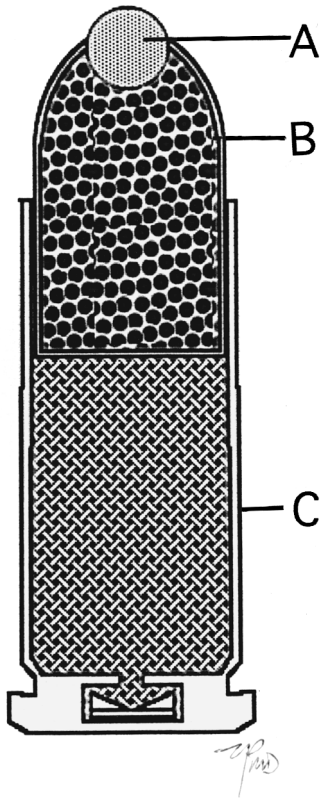


FIG. 1a—Artist's representation (not to scale) of a longitudinal section through a Glaser safety bullet. A = Plastic plug, B = Jacket filled with pellets, C = Cartridge casing with gunpowder.



FIG. 1b—Disassembled Glaser safety cartridge showing from top to bottom; plastic plug, pellets removed from interior of copper jacket, copper jacket, gunpowder and cartridge casing.

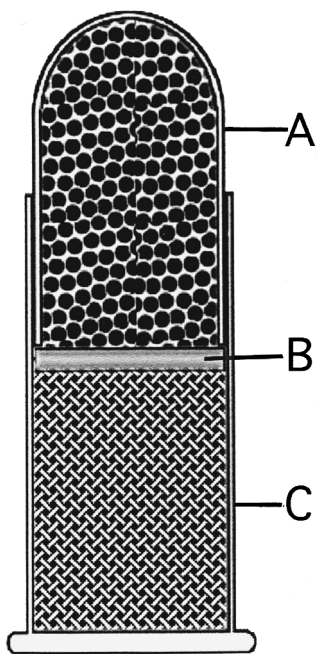


FIG. 2a—Artist's representation (not to scale) of a longitudinal section through a shotshell cartridge. A = Plastic cylinder over pellets, B = Wadding, C = Cartridge casing with gunpowder.



FIG. 2b—Disassembled shotshell cartridge showing from top to bottom; plastic cylinder, pellets, wadding, gunpowder, and cartridge casing.



FIG. 3—Lateral X-ray of skull (Case 1) which demonstrates numerous pellets and four larger fragments of jacketing in the posterior parietooccipital and posterior fossa distribution.

documenting the findings in individuals injured with Glaser safety ammunition.

The Glaser bullet travels to the target as a single unit, then fragments after impact. It can penetrate up to four sheets of wall-board prior to fragmenting (5) and consistently perforates 3/4 in. pine board from a distance. Although not designed to do so, it has been shown to perforate a car door at close range (6). In the absence of an intervening object the Glaser bullet produces the typical skin injury seen with solid core bullets.

The Glaser safety bullet is designed to minimize ricochet danger, but inflict more direct, severe tissue damage than conventional bullets. Bystander injury, due to perforation of the target, is less likely. It is available for 25- to 45-caliber handguns and for some high-powered rifles. Those with blue plastic tips are loaded with #12 shot, the grey plastic tipped ones are loaded with #6 shot. The blue-tipped bullets produce more projectiles after fragmentation than the equivalent caliber grey-tipped ones. Both have the same bullet weight, velocity, and muzzle energy at equivalent calibers (5).

Shot shell cartridges are designed for killing small rodents and snakes. The pellets begin to disperse at 381 mm (3) and, in the absence of an intervening object, will produce a miniature shotgun like pattern on the skin. Zumwalt et al. (3) described the superficial

nature of injuries from this ammunition. Reports on fatalities from shot shell ammunition document the injuries to be close range or contact (1,2,4).

Radiographs of individuals injured with Glaser type ammunition show the metal jacket and pellets within the tissues (Fig. 3). At autopsy, in addition to the metal fragments, the plastic plug may be found. No jacketing would be present in the tissues on X-ray following shotshell cartridge injuries (1,3,4). In contact or close range shotshell cartridge injuries, the plastic cylinder and wadding material may be found in the wound.

Clearly the wounding capabilities of the Glaser safety bullet are severe. The wounds inflicted from a distance (Case 3) resulted in fractured bones, extensive internal injuries and even produced small exiting fragments. The extensive skull fracturing seen in Cases 1 and 2 (at close or contact range) likewise highlight the dissipation of considerable energy.

Acknowledgment

The authors would like to thank Mr. Jim Carlson of the Forensic Imaging Department of the New York City Medical Examiners Office for the photographic work.

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