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Peculiarities of Certain .22 Caliber Revolvers (Saturday Night Specials)

Crimes of violence involving firearms have become so common that reports of yet another assassination or murder no longer seem to startle us. Measures taken by Congress to safeguard citizens resulted in the Gun Control Act of 1968. This law strengthened existing restrictions by prohibiting interstate shipment of mail-order firearms, prohibiting importation of certain handguns, and making personal identification a requirement when purchasing a weapon [1, 2]. Adequate implementation of Federal firearm legislation, however, has been lacking because of gaping loopholes in the law. While the importation of so-called "Saturday night specials" was banned, no restrictions were placed on the importation of their parts. Since 1971, handguns initially banned from importation have been assembled from imported parts in Florida and shipped to any part of the country as domestic weapons, under a different model number, with slightly modified design and at a more expensive retail price.

About 70 percent of handguns imported and distributed in the United States prior to the Gun Control Act of 1968 were manufactured in West Germany. Most of these weapons were inexpensive and poorly constructed. Inferior craftsmanship has been particularly noted in .22 caliber revolvers manufactured prior to 1968 by the Herbert Schmidt firearms company (for example, Rohm, EIG, Rosco Vestpocket, Madison, Valor, Romo, PIC, Thalson, York, Liberty [3]).

Normally, when the trigger of a revolver is pulled, one bullet is discharged from the muzzle of the gun. However, those .22 caliber revolvers manufactured by the Herbert Schmidt firearms company may fire two bullets concomitantly.

Following an assault by shooting during which a man was injured in this way, a small handgun was recovered and routinely processed at the Baltimore City Police Firearms Unit. The weapon was a .22 caliber Rohm RG 10 revolver with a barrel length of $2\frac{1}{4}$ in., built in 1968. Upon test-firing this gun from a distance of 2 ft, two bullets were discharged with each pull of the trigger. One bullet entered the 4-in. circle of the wooden recovery box; the other bullet, which exited from the left, upper chamber of the cylinder, penetrated the frame of the recovery box for $\frac{1}{4}$ in., then ricocheted and struck the shoulder of the firearms examiner.

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This incident not only demonstrates the danger encountered in test-firing certain weapons, but also the significance of such a misfiring phenomenon in a medico-legal setting. A series of experiments was therefore conducted to determine the shooting and injury patterns characteristic of such firearms. Six guns (one Rosco Vestpocket and five Rohm RG 10 .22 caliber revolvers) were collected at random at the Police Firearms Unit and placed at our disposal. All these weapons had been manufactured in or before 1968 and were used in felonies.

When test-firing a revolver for the purpose of firearms' identification, usually only one cartridge is placed in the cylinder; however, in order to detect a defective firing mechanism and to determine the particular shooting pattern, the test weapons were fully loaded. Test firings were carried out on anatomical specimens and paper targets at various distances. Caliber .22 short and long rim fire cartridges were used. All test guns fired two bullets concurrently by a single pull of the trigger, without any degree of predictability. One of these weapons misfired 27 times out of 39 test firings. In 21 instances two bullets were expelled with each firing, while the weapon jammed in each of the remaining six tests. An equally poor performance could be observed in the other five test guns. Different brands of ammunition occasionally accounted for an increase or decrease in the occurrence of misfiring. Whether one or two bullets were being discharged could not be determined by sound alone.



FIG. 1—Rosco Vestpocket .22 caliber six-shot revolver, barrel length $2\frac{1}{4}$ in. Note the marks on the frame of the gun produced by the bullet discharged from the cylinder chamber (arrow). The insert shows the front view of the gun and the position of the cylinder at the time of discharge. The frame causes a half-moon-like obstruction of the cylinder chamber, and is the object which is responsible for "shaving" the bullet.

Examination of the test weapons disclosed that unimpeded rearward motion of the cylinder following discharge of the fully loaded gun caused a second cartridge to be fired from the cylinder chamber immediately to the left of the barrel (Fig. 1). This missile was deflected from its course by scraping along the frame of the gun before striking the target in ricochet fashion. In one instance we noted that the second bullet exited by way of the ejector rod hole.

The degree of deviation of the missile discharged from the cylinder chamber from that of the bullet fired through the barrel of the gun differed, depending on the ammunition and the distance from which the test guns were fired. In contact shots the deviation ranged from $\frac{1}{2}$ to $1\frac{1}{2}$ in., varying from one shot to another using the same weapon. Comparison of the findings of all test weapons fired at contact showed that $\frac{1}{2}$ in. was the most commonly encountered deviation. Increase of distance between the muzzle of the test gun and the target produced an increase in deviation of the two simultaneously discharged missiles. The mean deviation in a shot fired from a distance of 1 ft measured $1\frac{1}{4}$ in.; from 5 ft, $3\frac{3}{4}$ in.; from 20 ft, $8\frac{1}{2}$ in.; and from 40 ft, $20\frac{1}{2}$ in. One revolver, however, produced deviation differences at 40 ft of from $17\frac{3}{4}$ to $35\frac{3}{4}$ in. Although the deviation pattern seems to be proportional to the distance from which the shot was fired, it should be pointed out that this differs from one gun to another and only repeated test shots with the same gun and ammunition may provide the answer in a specific instance.

Examination of the cartridge cases disclosed that only those bearing a firing pin impression could be positively identified as having originated from the gun in question. The second cartridges, which were fired by a rearward motion of the loosely fitting cylinder following discharge of the gun, did not show such an impression and therefore excluded the possibility of ballistic identification. Recovery and examination of the spent

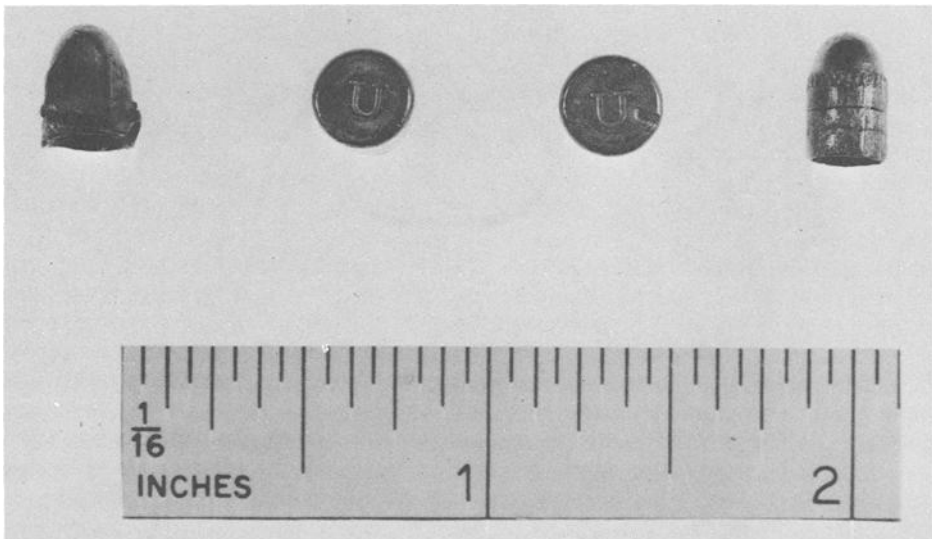


FIG. 2—From left to right: mutilated bullet expelled from the cylinder chamber (fine marks on the shaven surface can be matched with marks on the frame of the weapon); its cartridge case, which is devoid of a firing pin impression; cartridge case with firing pin indentation; and bullet with rifling marks on its cylindrical surface, indicative of having been fired by proper ignition.

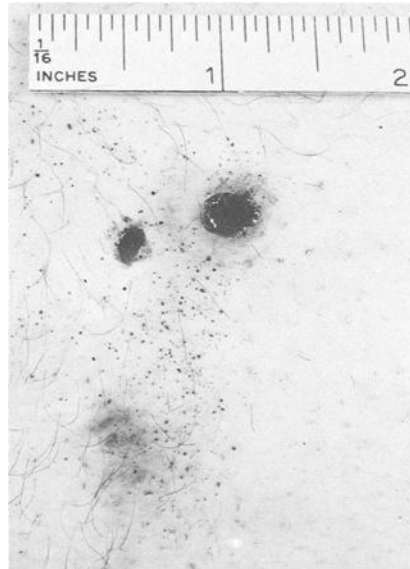


FIG. 3—Contact shot into anatomical specimen (human thigh) by a .22 caliber Rosco Vestpocket revolver using Western Long Super-X ammunition. On the right a typical contact wound is noted. The wound on the left was obviously caused by the bullet fired from the cylinder due to the wide distribution of burnt and unburnt gunpowder particles and the small amount of soot deposited on the target at some distance from this wound. This configuration is due to the fact that the bullet was fired from a distance of $2\frac{1}{4}$ in., which is the distance of the cylinder from the target.

bullets proved more rewarding. Rifling marks on the cylindrical surface of the missile identified this bullet as having been fired through the barrel of the gun. Since cylinder chambers are smooth-bored, those rifling marks were not present on the missiles discharged from the cylinder. However, that part of the bullet which on its course had struck the frame of the gun, had taken on the marks of the surface of that weapon. Under the comparison microscope matching of the fine striae could be obtained, thus unquestionably identifying the weapon from which the mutilated bullet was fired (Fig. 2).

The injury pattern produced by bullets which passed through the barrel of the guns used in this series was characteristic of either a contact or distant shot. By contrast, injuries produced by the second bullet which was fired through the cylinder, resembled more an exit than an entrance wound. Only close examination revealed very fine marginal abrasion as the characteristic feature of a bullet wound of entrance. Occasionally, at contact or near contact range, these injuries were surrounded by a small amount of soot and gun powder (Figs. 3–5). No lead particles, which could have resulted from the abrasion of the gun frame by the aberrant bullet, were identifiable on the targets.

Summary

Certain .22 caliber revolvers imported from West Germany prior to the Gun Control Act of 1968 are so poorly constructed that they prove dangerous not only to the shooter, but also to anyone in the general vicinity. In test-firing six such weapons, an attempt was made to determine the shooting and injury patterns characteristic of such firearms. Loosely



FIG. 4—Contact shot into anatomical specimen (human chest) by a .22 caliber Rohm RG 10 revolver using Western Long Super-X ammunition. Left: the injury produced by the cylinder bullet resembles an exit wound. The atypical wounding results from lack of gyrostatic stability of the bullet in flight, causing it to tumble and to strike the target in ricochet fashion. A small amount of soot and gunpowder can also be identified.

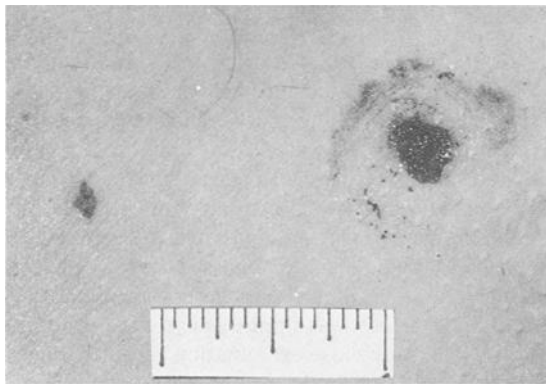


FIG. 5—Contact shot into anatomical specimen (human upper thigh) by a .22 caliber Rohm RG 10 revolver using Western Long Super-X ammunition. Soot and powder densely surround the injury produced by the missile fired through the barrel of the gun. The injury to the left was produced by the bullet fired from the cylinder chamber. No products of ignition are identifiable here. The explanation for the minimal abrasion is that the bullet, being shaven off on one side while scraping the frame of the gun, is sharp and “cuts” into the skin like a dull knife.

fitting cylinders were responsible for the emission of two bullets upon one pull of the trigger, producing injuries totally unexpected by an observer unaware of the possible malfunctioning of the poorly manufactured revolvers. The forensic pathologist confronted with a case involving this phenomenon should be the first to recognize the likelihood of such an occurrence at the time of autopsy. Subsequent ballistic examination of the cartridge cases and spent bullets at the crime laboratory is of importance for confirmation. In a specific instance the conclusions of these examinations may mean the difference between a homicide and an accident, or provide the explanation for the presence of two wounds in a suicide.

Acknowledgment

Figures 1 and 2 were provided through the courtesy of the Office of the Medical Examiner, State of Maryland, Baltimore, Md.

References

- [1] *Federal Firearms Laws*, National Rifle Association, Washington, D.C., June 1972.
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