CASE REPORT

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Not Under the Hammer: A Revolver Suicide

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ABSTRACT: A man died from a self-inflicted gunshot wound to the head. The only inconsistent finding at the scene was that the single fired cartridge casing in the latched revolver cylinder was not under the hammer. This inconsistency is explained by the discovery that the revolver cylinder can be hand-indexed in reverse. The revelation that the casing does not have to be under the hammer may be a novel concept to many investigators.

KEYWORDS: forensic science, forensic medicine, firearms, revolver, suicide, position of fired cartridge casing, indexing

A 44-year-old man lived with his 22-year-old daughter in a two bedroom apartment. The two bedrooms were at opposite ends of a short hallway, and had their own bathrooms. The two occupants lived their own lives, respected each other's privacy and did not enter the other's room without invitation. According to the daughter, she was alerted by a recorded telephone message in the afternoon that her father had not been to work. She had not actually seen him since 11 P.M. nearly two days ago, when he "appeared confused and disoriented." After listening to the message, she noticed that her father's shower was running. Frightened, she brought the security guard back to the apartment. They entered the father's bedroom and found that the partially closed wooden door to his bathroom had become swollen and wedged against the door frame as a result of the high humidity inside the bathroom. The shower was running, and the shower curtain was drawn across the bathtub, concealing most of the father's body. The security guard turned off the faucets; the bathtub drain did not have a stopper.

The decedent was sitting propped up at the end of the bathtub opposite the faucets, with the torso leaning slightly to the left, and clad only in a pair of waterlogged white underpants. Early putrefactive decomposition was characterized by moderate bloating and extensive blister formation. The body surfaces were moist, and the hands and feet were wrinkled, consistent with prolonged exposure to water. A midline gunshot wound on the occipital region of the head was associated with a moderate amount of gunpowder residue in and around the wound. Brain tissue extruded through a stellate exit wound on the left temporal scalp, pooling on the edge of the bathtub and on the floor directly beneath the head. A Dan Wesson .357 Magnum revolver with a 2 inch barrel was below the decedent's left shoulder, lying in brain tissue on the bottom of the bathtub alongside the left buttock. An indented ricochet mark was in the wall tile by the faucets, and a deformed medium caliber lead projectile was ensnared in the plastic shower curtain at the level of the mark on the wall tile.

After marking the position of the latched cylinder in the revolver, the six-chamber cylinder was opened, disclosing five empty chambers and a single fired cartridge casing located two chambers to the left of the chamber that had been beneath the hammer. The cylinder of a Dan Wesson revolver rotates clockwise, therefore the casing was four chambers past the hammer.

This case had several disquieting factors by this point in the investigation: 1) how was the daughter not aware of her father's shower running for nearly two days? 2) a number of books on serial killers, and a wall clock engraved with the names of John Gacy, Ted Bundy, and Peter Sutcliffe were in the daughter's bedroom; 3) the single fired casing in the revolver cylinder was four chambers past the hammer instead of being directly under the hammer.

The autopsy confirmed the cause of death to be a perforating gunshot wound of the head. Flecks of gunpowder were on the palm and volar aspects of the fingers on the left hand. The scene and autopsy findings were consistent with a suicide except for the position of the fired casing in the revolver cylinder. The revolver was examined by a police firearms examiner, and the report submitted to the lead detective indicated that the revolver was "fully functional." The medical examiner asked to see the revolver, and within two minutes of experimentation, determined how the position of the cylinder was consistent with a self-inflicted gunshot wound. After the trigger is pulled, and the cylinder rotation is complete, a small amount of counter-pressure exerted on the cylinder in a counterclockwise direction as the trigger is released will cause the cylinder to rotate in that direction, past one or more cylinder-stop notches (Fig. 1). The revolver is thus hand-indexed in reverse. This ability to overcome the cylinder-stop notch may not be demonstrable on all of the notches.

The probable scenario was as follows: The revolver was held in the right hand with the index finger or the thumb on the trigger (either position is anatomically possible). The left hand was

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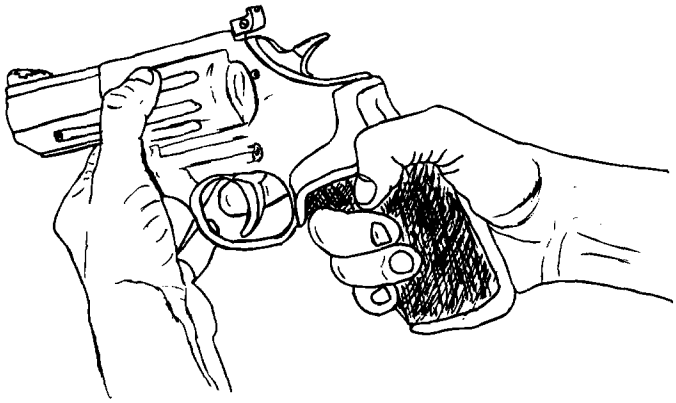

FIG. 1—*After the trigger is pulled, and as it is being released, gentle persistent counter-pressure on the cylinder (left hand) in the direction opposite to its usual rotation will cause the cylinder to rotate in the opposite direction in revolvers that can be hand-indexed in reverse.*

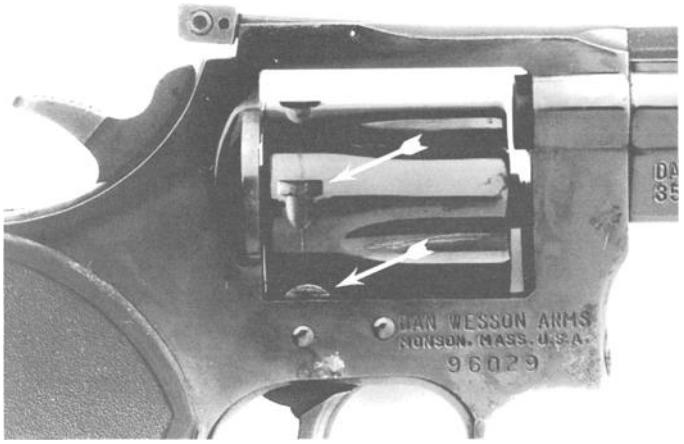

FIG. 2—*Dan Wesson Revolver with cylinder unlatched and partially swung out to show the cylinder-stop* (bottom arrow) *and cylinder-stop notch* (top arrow).

wrapped around the barrel to hold the muzzle in position against the back of the head. Because the barrel was only 2 inches long, the left hand overlapped the cylinder. After the revolver was fired, it slipped from the right hand but remained in the grasp of the left hand, falling to the left of the body as the left arm dropped. The gunpowder on the left hand would be consistent with this scenario.

Discussion

Medical examiners and police have traditionally been trained to expect the fired cartridge casing to be in the chamber under the hammer following a self-inflicted revolver gunshot wound that is immediately incapacitating. The usual teaching is that if the fired casing is in a chamber other than the one under the hammer, the revolver must have been fired again, or, the cylinder was unlatched and rotated before being closed. This raises the suspicion of someone tampering with the revolver and the scene, the possibility of an assisted suicide, or a homicide. Our case demonstrates how a revolver that can be hand-indexed, or that is not indexing properly may complicate an investigation. Only six (1–6) of 17 criminalistics textbooks reviewed (1–17) instruct that the revolver cylinder be marked to identify the chamber under the hammer, but do not explain the significance of knowing the cylinder and chamber positions.

Indexing refers to the rotation and stopping of a revolver cylinder. In the usual context, it is the completed rotation of the revolver cylinder after the trigger is pulled. The cylinder-stop protrudes by action of a spring and engages one of the cylinder-stop notches (Fig. 2). This aligns the opposite chamber directly in line with the barrel ("in battery") and stops the cylinder from rotating further. When the trigger is released, the cylinder-stop should remain engaged. Improper indexing, or failure of the cylinder-stop to prevent rotation, may occur if the cylinder-stop is missing, worn, corroded, defaced, or does not protrude completely, if the cylinder-stop notch is worn, or if the gap between the cylinder and the frame is excessive. The buffing process to prepare the revolver cylinder for refinishing could also affect indexing. That a revolver cylinder can be hand-indexed in reverse is working knowledge among firearms examiners, but is a concept that may not be familiar to pathologists or even police investigators.

How common is this phenomenon? The authors tested all the double-action .357 Magnum swingout revolvers in the Metro-Dade Police Department Crime Laboratory Reference Firearms Library composed of impounded, unclaimed, and abandoned guns. Table 1 lists the revolvers tested, and those found to exhibit the same phenomenon of cylinder rotation (hand-indexing in reverse). By applying a gentle but steady resistance on the cylinder opposite to its usual rotation, we were able to hand-index 15 of the 73 revolvers (approximately 20%) in reverse, after the trigger was pulled and was being released. This, of course, would move the casing away from its expected position under the hammer (unless the cylinder makes a complete revolution). The degree of rotation, or number of chambers bypassed, varied with each firearm. Hand-indexing in reverse was also demonstrated in a sampling of .38 Special revolvers, and the principle probably applies to all double-action revolvers. Single-action revolvers were not tested.

This case was instructive from several perspectives, and reinforced some basic principles of investigation. Firstly, if the apparent circumstances are not entirely consistent with your training and experience, be persistent in seeking answers. If the apparent circumstances are not entirely consistent with your instinct, despite your training and experience, be even more persistent in seeking answers. Secondly, every case must be evaluated in the complete context of its history, scene circumstances, autopsy findings, and other laboratory findings. Thirdly, there must be clear communication between the investigative parties so that each understands what the other wants to know. The detective submitted the revolver to the original firearms examiner with the question "is the firearm

TABLE 1—*Double action .357 Magnum revolver.*

Make	Number tested	Hand-indexed in reverse
Arminius	2	1
Astra	1	0
Charter Arms	2	0
Colt	13	0
Dan Wesson	5	4
High Standard	2	1
Llama Comanche	4	0
Ruger	8	1
EIG	1	0
Smith & Wesson	28	4
Taurus	5	3
Thermodynamic System	1	1

functioning properly?" Translation: "Is there anything wrong with this revolver that would make the cylinder rotate to this unexpected position without intervention by another subject?" The firearms examiner's written report indicated that "the revolver is fully functional." Translation: "This revolver is fully capable of firing a projectile in the expected manner." The examiner's working notes included "the cylinder can be hand-indexed in reverse two positions counterclockwise. It can overcome the cylinder-stop cutouts on five of the six notches." The information that the detective wanted was available all along, but was not communicated. Finally, the dictum that the fired cartridge casing has to be under the hammer is no longer etched in stainless steel. The casing may be in any cylinder position if the revolver is not indexing properly or has been hand-indexed. Be cautious, as it will be the exception rather than the rule, and it must be demonstrated that the revolver can be hand-indexed.

The father had medical problems and had expressed suicidal ideation in the past. The daughter did not hear the father's shower running because the air conditioning was very loud, just like in the author's (EOL) apartment in the same building.

Acknowledgments

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