Two Cases of Tandem Bullets—One Homicide and One Suicide

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Abstract: We report 2 unusual cases of tandem bullets. Case 1 is a homicide involving a piggyback screw. Case 2 is a suicide involving multiple tandem bullets as a result of improper ammunition size. Tandem bullet injuries can have a wide variety of presentations. Therefore, it is essential that forensic pathologists understand the mechanisms of tandem bullet wounds and familiarize themselves with the autopsy and radiological findings seen in tandem bullet injuries. This report supports that use of incorrect caliber ammunition and the lodgment of foreign objects in the barrel of a gun are possible causes of tandem bullet injuries.

Key Words: tandem bullets, piggyback bullets, gunshot wounds, homicide, suicide

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The tandem bullet phenomenon is not exclusive to any one manner of death. In this report, we will discuss 2 cases of tandem bullets—one is a homicide and the other a suicide.

Tandem bullets occur when the nose of a fired bullet contacts the base of another bullet that is lodged in the barrel of a gun. If the transfer of kinetic energy is great enough, both bullets will leave the barrel together, in tandem.[1] Another term, "piggyback bullets," is sometimes used to refer to these types of situations as well. It is also possible for an object other than a bullet to become lodged in the barrel of a gun. This foreign object can be dislodged and forced out of the gun when a bullet is loaded into the barrel and fired.[2]

The literature on tandem bullets shows that use of incorrect caliber ammunition and lodgment of foreign objects in the barrel of a firearm are potential circumstances under which tandem bullet wounds are observed.[2]

We report 2 unusual cases of tandem bullets. Case 1 is a homicide involving a piggyback screw. Case 2 is a suicide involving multiple tandem bullets as a result of improper ammunition use.

CASE 1: PIGGYBACK SCREW

The decedent, a 43-year-old man, presented with 2 penetrating gunshot wounds to the head (Fig. 1). Both were determined to be entrance wounds. The entrance wounds were labeled *A* and *B*, which does not correspond to the sequence of injury.

Entrance wound A was a penetrating gunshot wound of head at the left temporal scalp. It was located behind the top of the left ear, 4 in from the top of the head and 6¼ in left of anterior midline. It was an oval perforation measuring 1/2 × 3/8 in with a 1/8 in asymmetrical circumferential margin of abrasion, at 12 to 1 o'clock and at 9 o'clock. There were 3 radially oriented 1/4 in superficial lacerations at 1 o'clock, 3 o'clock, and 9 o'clock, each associated with subjacent palpable bone fragments. Soot (burned gunpowder) was identified grossly and microscopically at the skin surrounding the wound. The overlying knit cap had a defect with adherent dried blood and brain matter. The track of this wound moved left to right. After perforating the skin, the track created a contusion of the left temporal scalp associated with temporalis muscle hemorrhage. The track entered the cranial cavity via a defect of the temporal bone, which had fractured. Soot was identified at the entrance on the outer and inner table of the skull and on the dura. The track perforated the dura, left temporal lobe of the brain, left basal ganglia, lateral ventricles, right basal ganglia, and right parietal lobe. Multiple lead fragments were recovered in the brain matter of the right parietal and temporal lobes. The projectile fragments appeared to be of a small caliber and were mixed with bone fragments (Fig. 2).

Entrance wound B was a penetrating gunshot wound of the left ear and scalp. The entrance was on the upper outer helix of the left ear, 4½ in from the top of the head and 6 in left of the anterior midline. Soot was found microscopically at this entrance wound. A corresponding 3/8 in round defect was on the subjacent

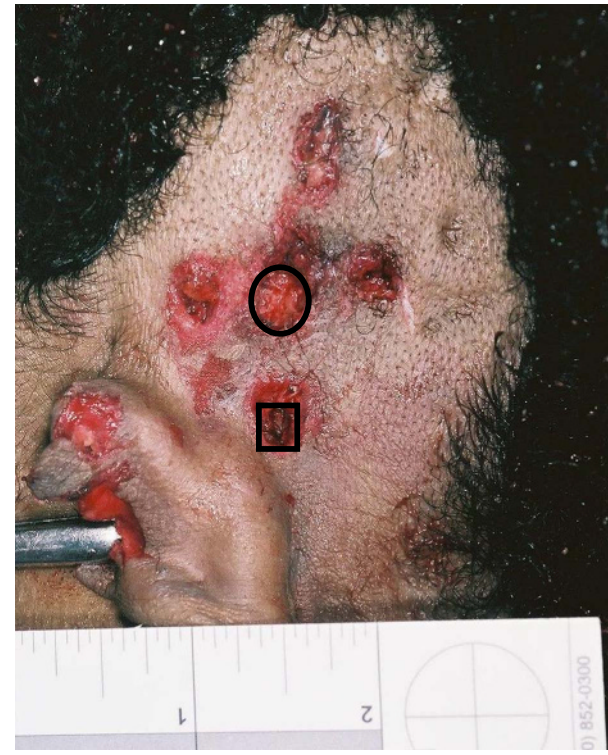

FIGURE 1. View of decedents left temporal scalp. Wound A is seen inside the circle and wound B is seen inside the square. Additional dermal lacerations were caused by underlying skull fractures. Figure 1 can be viewed online in color at www.amjforensicmedicine.com.

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FIGURE 2. Screw recovered from wound B and bullet fragments from wound A. Figure 2 can be viewed online in color at www.amjforensicmedicine.com.

left parietal scalp. There was no soot or stippling of the adjacent scalp skin. The overlying knit cap had a defect with adherent dried blood and brain matter. The track of this wound moved left to right and entered the cranial cavity via a defect of the posterior squamous portion of the temporal bone. This track was behind and below the defect created by wound A. A small grey screw with a painted red cap was recovered from the right temporal lobe. The screw's cap was 20/100ths of an inch (Figs. 2, 3).

CASE 2: TANDEM BULLETS DUE TO IMPROPER AMMUNITION

A 50-year-old man was found deceased in his home by a family member performing a well-being check after being notified by the decedent's employer that the decedent had not been showing up to work for several days. The family member found the decedent with a single penetrating gunshot wound to the neck and a .45 caliber pistol on his lap (Fig. 4). The pistol had a spent casing in the breach. A magazine was found on the floor in front of the subject; however, the report from the scene does not discuss if there was anything found inside the magazine. A spent .45 caliber casing was also found in the same room as the decedent.

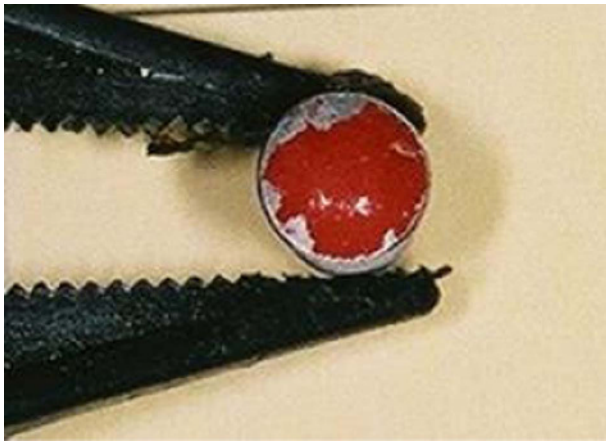

FIGURE 3. Superior view of screw recovered from wound B. Figure 3 can be viewed online in color at www.amjforensicmedicine.com.

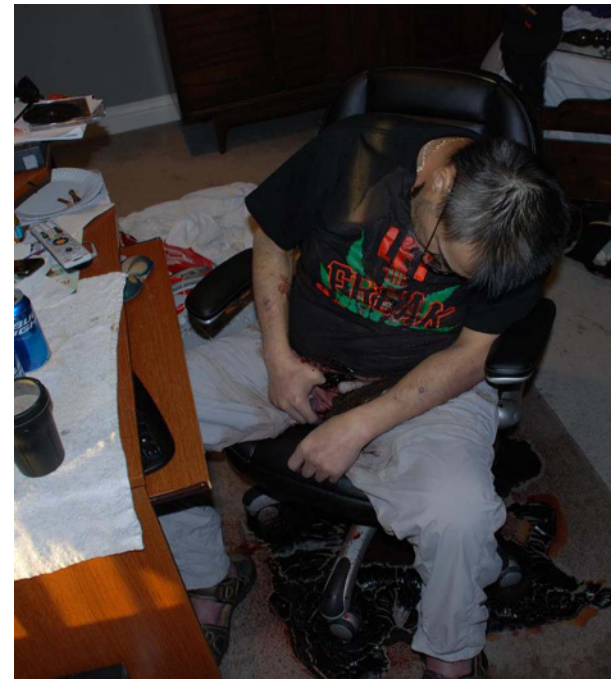

FIGURE 4. Decedent found with gunshot wound to the head. Figure 4 can be viewed online in color at www.amjforensicmedicine.com.

No suicide note was found at the scene. However, the family did report that the decedent had expressed feelings of loneliness in the past.

FIGURE 5. Radiograph of head and neck region of decedent from case 2.

FIGURE 6. Right neck region of decedent from case 2. Figure 6 can be viewed online in color at www.amjforensicmedicine.com.

A postmortem radiograph revealed multiple metal fragments in the left neck region of the decedent. Upon autopsy, 3 bullets, 2 casings, and a casing primer were removed from this area (Fig. 5).

The entrance wound (Fig. 6) of the right neck was located 8½ in from the top of the head and 2¼ in right of midline. Dense soot was observed around the entrance. The wound track was right to left, front to back, and approximately 10 degrees upwards. Beneath the entrance, the muscles subjacent to the entrance wound were bright cherry red, and hemorrhage was found at the right anterior strap muscles of the neck including the right sternocleidomastoid, thyrohyoid, and sternothyroid. The wound track lacerated the right carotid artery, traveled behind the retropharynx, and ended at the left thyroid cornu, with palpable fractures of the left lateral process of the third cervical vertebra. Powder residue was visible in the wound track.

The site of lodgment was at the left neck, adjacent to the left thyroid cornu in the left lateral retropharyngeal space (Fig. 6). Two cartridge casings and 3 associated unjacketed wadcutter bullets were recovered. The cartridge casings were inscribed with "WESTERN 38 SPECIAL" at the base. The primer of 1 casing was detached but found adjacent to the casing in the body (Fig. 7).

Two of the bullets recovered from the body had round indentations at their tips corresponding in size to the casing primers, indicating that these were the second and third bullets fired. One bullet had no indentations, indicating that it was the first bullet that lodged in the barrel of the pistol. One cartridge casing was mushroomed, and the other casing was deformed.

DISCUSSION

In case 1, the reason there were 2 entrance wounds instead of 1 is because the screw and bullet formed an unstable projectile. The objects of an unstable projectile will follow the same trajectory for a short distance, but eventually disassociate and follow their own paths.[1] The appearance of the entrance wounds did not suggest a contact gunshot wound.[3] It is likely that the screw and bullet had some distance to travel before entering the body, allowing their paths to slightly disassociate. Therefore, we observe the entrance wounds to be close, but not overlapping.

We postulate that the screw with the red painted tip was lodged inside the barrel of the gun when the gun was fired. The force of the bullet dislodged the screw and forced it out of the barrel, directly in front the bullet. The screw and bullet left the muzzle of the gun in tandem.

There are several other cases in the literature discussing the use of foreign objects as tandem projectiles. Mihailovic et al[4] report a case in which a man used a nail and a screw as tandem missiles to commit suicide by rifle at the neck region. In that case, there was only 1 entrance wound that later split into 2 channels. One channel contained the screw, and the other channel contained the bullet and nail. It was determined that the firearm was used at close range.[4] Because the projectiles exited the barrel of the gun close to the body surface, it is logical that the tandem objects

FIGURE 7. Three bullets, 2 casings, and primer found in the neck of the decedent. Sequence shown is suspected sequence of entry (top to bottom). Note that the indentations on the second and third bullet noses correspond to the preceding casing's base. Figure 7 can be viewed online in color at www.amjforensicmedicine.com.

entered the body together via 1 entrance wound before becoming disassociated and moving in different directions.

Other reports have described tandem injuries with foreign objects as well. Ellis[5] writes of a man who committed suicide by rifle and the use of a barrel-cleaning brush as a tandem missile. It is not known whether the decedent left the brush in the barrel of his rifle intentionally.

In case 2, the firearm discovered with the decedent was .45 caliber. A spent .45 caliber casing was also found in the same room as the decedent, but the autopsy did not show any indication that this casing was involved in the injuries sustained by the decedent. We postulate that the decedent used a .45 caliber round to test his weapon before loading it with .38 caliber ammunition and using the weapon on himself.

The 3 bullets found in the body of the decedent were .38 caliber. We postulate that the decedent likely pulled the trigger of his firearm 3 times after he tested it. The cartridges must have been manually loaded into the gun because the .45 magazine would have been too short to fit the .38 Special ammunition. The first 2 initiations resulted in misfires. The third and final initiation of the weapon fired the gun, propelling the third round, and forcibly dislodging the 2 rounds that were stuck in the barrel. The firing of the third round ignited the primer of the first and second casings. Therefore, the casings of the first and second rounds are deformed.

There have been other case reports citing improper ammunition use as the cause of tandem bullet accidents. Two different publications detail cases of .32 caliber ammunition being improperly used in .38 caliber weapons. The same sequence of events followed for both cases. A .32 caliber round was loaded into the barrel of a .38 weapon, and the trigger was pulled. However, the gun did not fire. After the initial misfire, a round of appropriate size, .38 caliber, was loaded into the barrel and fired. Because this round was correctly sized, the firing pin of the gun properly contacted the primer of the .38 round. As the round moved forward out of the barrel, it activated the primer of the .32 round. In both cases, the victims sustained 1 gunshot wound on the body surface, but the single wound contained a .32 bullet, .32 casing, and .38 bullet. Both cases also explain that the recovery of a cartridge case was a key contributor to the conclusion that the tandem bullet phenomenon had occurred.[6,7] In the case presented here of .38 caliber ammunition used in a .45 caliber weapon, cartridges were similarly recovered and corroborate suspicion of tandem bullet injury.

Both previously published cases also explain that, when incorrect ammunition is loaded into a firearm, the firing pin cannot properly strike the primer.[6,7] This is likely what occurred in case 2 during the first and second attempts to fire the gun. It is not clear, however, why the third attempt to fire the gun in case 2 was successful, given that the same improperly sized ammunition was used.

The indentations found on the bullets in case 2 corroborate the suspicion of the tandem bullet phenomenon (Fig. 7). Other cases in the literature surrounding tandem bullets have also observed similar corresponding indentations on bullets suspected of leaving the muzzle of a firearm in tandem.[2] In a case reported by Simmons,[8] a deceased man was found with 2 contact gunshot wounds to his head and 4 bullets inside of his head. An x-ray showed that 3 of these bullets lodged in a nearly horizontal line, however facing different directions. Upon autopsy, when the bullets were removed from the body, the 3 bullets found in close proximity were lined up nose to base, and their defects aligned.[8]

When a tandem bullet injury is suspected, if possible, investigators should check if the bullets or casings recovered from the decedent's body correspond to the caliber of weapon used to fire the bullets. In addition, the projectiles recovered from the body should also be thoroughly examined for corresponding indentations to suggest tandem expulsion from a firearm. When a decedent presents with gunshot wounds and unusual foreign objects are recovered from the body, this should cue forensic pathologists to look for other evidence to support or rule out that a tandem bullet event has taken place. The foreign object recovered from the body must be small or narrow enough to fit in the firearm used to inflict the injury.

In conclusion, it is important for forensic pathologists and death scene investigators to be familiar with tandem bullet wounds because their determinations can have legal implications for the family of the decedent and all of those involved. Because tandem bullet wounds can have a wide variety of presentations, it is essential that forensic pathologists understand why and how bullets or foreign objects can leave the muzzle of a gun in tandem. This report further supports that the use of incorrect caliber ammunition and the lodgment of foreign objects in the barrel of a gun are possible causes of tandem bullet injury.

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