As a library, NLM provides access to scientific literature. Inclusion in an NLM database does not imply endorsement of, or agreement with, the contents by NLM or the National Institutes of Health.

Learn more: PMC Disclaimer | PMC Copyright Notice



Acad Forensic Pathol. 2020 Jun; 10(2): 104-112.

Published online 2020 Nov 25. doi: 10.1177/1925362120956855

PMCID: PMC7691936

PMID: 33282045

# Homicides Disguised as Staged Suicides

Samuel P. Prahlow, Stephen Cohle, Brandy Shattuck, and Joseph A. Prahlow

### **Abstract**

Determining the correct cause and manner of death are among the chief responsibilities of the forensic pathologist. When confronted with a case having a questionable manner of death, it is important for scene evidence, witness statements, and forensic autopsy findings to be thoroughly reviewed before certifying the manner of death. Herein three gunshot wound cases are presented which initially were suspected to be suicides but were instead determined to be homicides through full investigations with correlation to autopsy findings.

Keywords: Forensic pathology, Gunshot Wound, Homicide, Suicide, Manner of Death

#### Introduction

Deaths related to homicidal and suicidal gunshot wounds (GSWs) are common in the United States. In most instances, investigation allows for relatively straight-forward differentiation between homicides and suicides. Occasionally, however, such differentiation proves to be quite difficult, with some cases ultimately being certified with an "undetermined" manner of death (MOD). Certification of a death as a homicide should not be undertaken lightly, as it may have profound legal ramifications. In some situations, initial impressions regarding the MOD in various types of medicolegal death investigations differ from the final rulings after autopsy and complete investigation (1-5). A number of investigative and autopsy findings help to differentiate a suicidal GSW case from a homicidal case. This report describes three deaths related to GSWs of the head where initial investigation suggested that the deaths represented suicides; however, based on scene and autopsy findings, along with subsequent investigative information, each case

was properly ruled as a homicide. The cases are presented, focusing on important aspects of the investigations and autopsies which led to the proper MOD certification.

## **Case Reports**

#### Case 1

An 18-year-old man was found dead on the floor of his secured apartment, with blood on his head and face and a small-caliber, semiautomatic handgun near his body. A blanket was partially covering his hands and face (Figure 1). His sister had come to check on him after hearing rumors that he was dead. A letter written to his girlfriend was found elsewhere in the apartment. In it, the decedent asked her for forgiveness. The initial police and death investigator impression was that the case represented a probable suicide. Subsequent body examination revealed that the decedent's hands were clasped together, in a "folded hands" position (Figure 2). There was a penetrating contact GSW of the right temple, with the bullet path traversing the right temporoparietal cerebrum, the central brain, and the left temporal cerebrum. The cause of death (COD) was a "contact GSW of the head." As there was no possible way for the decedent to have folded his hands after shooting himself through the brain, the MOD was ruled "homicide." Police were immediately notified. Subsequent police investigation revealed that the decedent had been involved with dealing drugs. Another dealer confessed that he had shot him in the head while he was sleeping on the floor, leaving the gun adjacent to the body to make it appear that the decedent had shot himself. The letter to the girlfriend was considered coincidental.



### Figure 1

The 18-year-old victim described in Case 1. Note the bloodstains on the wall and the fact that the decedent's hands and forearms are under an adjacent blanket.

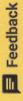




Figure 2

Close-up photograph of the hands of the victim in Case 1, showing that the fingers are clasped together in a "folded hand" position.

#### Case 2

A 40-year-old female was found dead in bed by her husband after he heard a gunshot. Initial investigation, including interviews with the husband, suggested that the case represented a suicide. A 9-mm semiautomatic handgun was found adjacent to her body. The woman had suffered from depression since being kicked in the head by a horse approximately 14 months previously. Autopsy initially revealed two apparent exit type defects on the left lateral forehead region ( **Figure 3**), as well as a single contact entrance wound of the right temporoparietal scalp ( Figure 4); however, during continued examination, a second contact entrance was found on the right temporal scalp, superior to the ear (Figure 5). The uppermost GSW perforated the right parietal and left frontal cerebrum before exiting, while the lowermost wound perforated the right temporal and frontal lobes, as well as the left frontal lobe before exiting. Both wound paths involved deep central structures of the brain (Figure 6). Blood spatter evidence on the husband's clothing suggested that the husband was in the vicinity of his wife at the time of gunfire, a direct contradiction to his story. In addition, a letter written by the woman was discovered which contradicted the horse kick claim, accusing the husband of having assaulted her. The COD was "GSWs (two) of the head." Based on the fact that it was impossible for the victim to have fired both of the shots in this case, the MOD was ruled homicide. The husband was subsequently charged and convicted of murder.



Figure 3

An autopsy photograph showing 2 exit-type gunshot defects on the lateral left forehead from Case 2.



Figure 4

Contact gunshot wound of the right temporoparietal scalp from Case 2. Note the soot as well as the rare stellate lacerations.



Figure 5

Another autopsy photograph from Case 2, showing the originally described contact gunshot wound (as shown in **Figure 4**), as well as a second contact gunshot would which was inadvertently incised during scalp reflection. The scalp incision has been reapproximated in order to show the entrance wound. Note the marginal soot deposition, characteristic of a contact range wound.



Figure 6

A cross-section of the brain from Case 2, showing wound pathways from both gunshot wounds that intersect with one another and involve the deep central structures of the brain.

### Case 3

A 35-year-old male was found dead in the basement room where he slept, which also served as his firearm storage room (Figures 7 and 8). He reportedly slept in the room because he and his wife were in the process of divorcing. The wife reported that she and her husband had argued while in the same room. During the argument, she reportedly "thumped him on the head" because of something he said. He then produced a handgun and fired multiple shots, with one striking the door of the room (Figure 9) and one striking her in the arm. She claimed that she then passed-out, and was eventually awakened when she heard another gunshot. Upon awakening, she found her husband's body lying supine on his mattress, which was on the floor, with a gun in his dominant right hand and blood on his head/face. A subsequent medicolegal autopsy revealed a gunshot entrance wound of the left cheek, in front of the ear, with gunpowder stippling in a roughly oval-shaped area in front of, above and behind the entrance wound, measuring up to  $12.5 \times 20.0$  centimeters, involving the nose, face, and ear (Figure 10). There was no identifiable soot. The projectile perforated the left skull, the left temporal lobe, the central basilar skull, the right temporal lobe, and the right temporal skull. Fragments were recovered from within the brain and the right scalp. The pathway of the bullet was from left to right, slightly from front to back, and slightly upward. The COD was "gunshot wound of head." Measurements of the decedent's arm length were taken at autopsy. Test-firing of the weapon revealed that the muzzle of the firearm was approximately 46 cm (18 inches) from the left side of the decedent's face when it was fired. Using a toy gun and using an assistant with similar body build, size, and arm length, the following conclusions were determined: In order for the decedent to have shot

6 of 17 11/22/2023, 3:03 PM

himself and produce the stippling pattern present evident at autopsy, he would have had to hold the weapon with his nondominant left hand (contrary to the wife's description), using an unconventional grip. In contrast, using the right hand, it was not possible to hold the gun far enough from the face to produce a muzzle-to-target distance of 45 cm (18 inches). Additionally, scene and ballistics investigation showed that multiple rounds had been fired from multiple weapons. Most importantly, review of scene photographs revealed that fragments of door were present on top of the victim's body (Figures 11 and 12) and on top of pools of partially dried blood at the scene (Figure 13), indicating that the shot through the door occurred after the husband was dead, not before as the wife had stated. Based on the contradictory autopsy and scene findings, the MOD was ruled a homicide. The wife later confessed to having killed her husband and staging the scene to correlate with her false statements regarding the sequence of events.

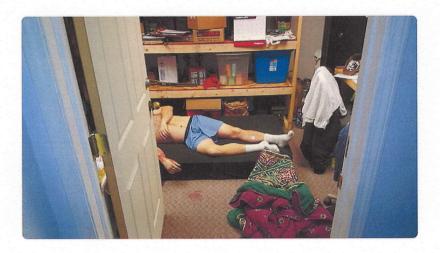


Figure 7

The male decedent in Case 3, lying supine on a mattress in his gun room.

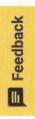




Figure 8

Another view of the decedent in Case 3.



Figure 9

A bullet defect on the door of the gun room.

F Feedback

11/22/2023, 3:03 PM



Figure 10

An autopsy photograph of the decedent in Case 3, showing an intermediate range gunshot entrance wound just in front of the left ear.



Figure 11

A scene photograph from Case 3, with arrows indicating debris from the gunshot that perforated the edge of the door, as shown in **Figure 9**.

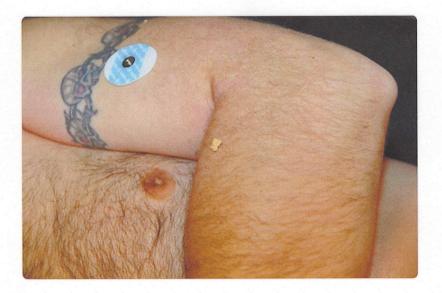


Figure 12

Another piece of door debris found on top of the decedent in Case 3.



Figure 13

A close-up view of the pool of blood that was adjacent to the decedent and mattress in Case 3 (seen in **Figure 8** ), with arrows indicating debris from the door lying on top of the blood.



# Discussion

Each of the presented cases was initially considered to be a probable suicide. The first impres-

Feedbac

sion of suicide was related to various scene findings, as well as statements made by others. Findings that suggested suicide in these cases included identifying a firearm adjacent to or within the hand of the decedent (all three cases), an apparent contact or close range GSW (all three cases), the presence of an apparent suicide note (case 1), false narratives made by witnesses/perpetrators (cases 2 and 3), and indicators that the decedent had been depressed or otherwise mentally unstable or stressed prior to the death (all three cases). Fortunately, important scene and autopsy findings allowed forensic pathologists to determine that each case actually represented a homicide. Discovering a wound path (or paths) through the brain that would not allow for subsequent purposeful motor function was key in determining that cases 1 and 2 were not suicides. Proving the physical impossibility of the findings was key in all 3 cases, where the victim in case 1 would not have been able to fold his hands after sustaining the shot, the victim in case 2 would not have been able to fire two shots because each would have been immediately incapacitating, and the victim in case 3 could not have physically produced the GSW at the measured range-of-fire using the hand in which the gun was found. The recognition of scene findings that did not correlate with a suggested story was another factor for recognizing case 3 as a homicide, as the debris from the door shot obviously occurred after the fatal shot, not before.

When investigating a death, it is important to take into consideration the scene findings, the case history, forensic evidence, and findings at forensic autopsy (6). Although reducing cognitive bias is important in all forensic science disciplines, it is important to remember that forensic pathology cannot be practiced without knowledge of surrounding investigative information (7). Certain cases initially thought to represent one MOD can eventually be determined to be a different class of case after collaboration between death investigators, police, and the forensic pathologist. Some represent instances where true suicides are initially thought to be homicides. Some are suicides which are initially considered accidents. Others represents true accidents which are initially considered homicides. Even occasional natural deaths are thought to represent a nonnatural MOD. Finally, like the cases presented, some cases represent homicides that were initially considered suicides. Herein, we will discuss only suicides initially considered homicides, and homicides that are initially considered suicides.

## **Suicides Initially Considered Homicides**

Ohshima and Kondo describe a series of stabbing related suicides that exemplify the need for cooperation between death investigators and forensic pathologists, as well as the necessity of toxicological testing in certain cases when ingestion of toxins may help bring to light pertinent history to help make the determination of the correct MOD (8). Another case illustrates the need for scene findings to be shared with the forensic pathologist, as the MOD could not be accurately determined using just the autopsy information alone (9). In this case, the decedent committed suicide by tying a shotgun to a tree and pulling the trigger via a string, creating a distant range shot (9). Similarly, a case reports a suicide victim connecting a revolver to a weight with a rope and taking his life on a bridge so that the firearm would be pulled into the lake in an attempt to cover-up the true nature of the death (10). Another similar suicide was reported where the suicide victim tied the gun to helium balloons so that, after discharge, the balloons would carry the

weapon away from the body in order to give the appearance of a homicide (11). Another case describes a woman who stabbed herself and attempted to disguise it as a homicide by changing clothes and concealing the weapon (12). Three cases, first supposed to be homicides, were reported as suicides through a thorough investigation (13). One case of interest was a suicide that eventually was successful through an automatic weapon that discharged 3 rounds into the decedent's head (13). Another case was reported where the suicide victim attempted to discharge two handguns to end his life (14). Another case with multiple stab wounds is described as a suicide, which underscores the fact that the presence of multiple injuries does not necessitate homicide as a MOD (15). Lesions that mimic GSWs have been reported to result in a suicide being initially misidentified as a homicide (4). As homicide rulings may result in life-altering ramifications for those potentially accused of committing a homicide, it is imperative that forensic pathologists, death investigators, and police recognize that circumstances exist where a decedent's desire to conceal a suicide due to embarrassment, or perhaps a desire to frame others, may result in their determination to conceal the true circumstances related to their death by creating a scene that appears homicidal rather than suicidal.

## **Homicides Initially Considered Suicides**

Several examples of disguising a homicide as a suicide have been documented within the forensic literature. A case is described where the investigators ruled-out suicide by firearm by measuring the distance at which the decedent would need to hold the long gun in order to produce the wound on the body (16), similar to case 3 in the presented series. Zietlow and Hawley report three separate intraoral gunshot associated deaths thought initially to be suicides which were ultimately determined to be homicides (17). In another report, a woman was found to have apparently jumped from the third floor of her house; although initially thought to be a suicide, it was determined that the decedent suffered a homicidal head/skull injury prior to the fall (18). This is a good example of how a homicide may be committed and then the perpetrators may try to cover-up the underlying injuries by attempting to give the appearance of a suicide, such as jumping off a building. Sauvageau reports that although not typically thought of as being homicidal in nature, certain hanging deaths do, in fact, represent homicides (19). As such, death investigators and forensic pathologists should not discount homicide as a potential MOD until a thorough investigation is complete (19). Also reported in the literature is a case of a hanging initially thought to be suicide, but later determined to be a homicide following admission/confession of the ex-boyfriend (20). The cases presented in this report add three additional cases to the literature of homicides which were initially considered suicides.

# Location/Type of Wound in GSW Cases

Whether a case is classified as a suicide or a homicide is obviously of vital importance, with wide-ranging potential ramifications. Gunshot wound characteristics can provide valuable information to aid in correctly identify the MOD. Identifying and knowing the difference between homicidal and suicidal injuries produced by firearms allow the forensic pathologist to make the best-informed decision regarding a suspicious death. Although the following information may seem self-evident, it is important to acknowledge the facts as such. Suicidal wounds are more

12 of 17

F Feedback

likely to be at contact range to the head, whereas homicides are more likely to be from intermediate or distance range and produce wounds at multiple locations on the decedent (21 -23). Intraoral handgun wounds are more likely to be suicidal, while multiple GSWs from a handgun are more likely to indicate homicide (23). Others report that multiple GSWs, with atypical entrance wounds or from distant range were indicative of a homicide; whereas the typical location of suicidal GSWs was in the head, neck, or heart regions of the body (24). Berens et al. suggests that the site of entry wound, the direction of the internal bullet path, the range of fire, and the circumstances of death are all useful factors in determining whether an intraoral GSW is homicidal or suicidal (25). Indeed, each of these factors can be utilized in virtually every GSW case, no matter the wound location, in an attempt to arrive at the correct MOD certification. To only review one or some of these criteria for suspicious GSW related deaths would be bad practice (22,23,26,27), as would attempting to interpret the autopsy findings without knowledge of scene and investigative information.

## Multiple GSW Suicides

Multiple GSW suicides are not especially rare; however, whenever they do occur, they deserve additional scrutiny (28 -33). One study indicates that .22 caliber handguns predominate in multiple GSW suicides (33). Of special concern are gunshot suicides involving multiple shots of the head. As smaller caliber ammunition tends to involve less kinetic energy and therefore produces less destruction compared to larger caliber rounds at any given location, it is not surprising that ammunition such as .22 caliber rounds might be more commonly encountered in multiple GSW suicides involving the head. According to DiMaio, GSWs of the head that only injure the frontal lobes are the most likely to allow for continued ability to act (fire a second bullet, move, etc.), whereas a bullet wounding the deep structures of the brain, such as the basal ganglia, will immediately incapacitate the victim (34). Thus, the documentation of bullet pathways is especially important in a suspected suicide case involving multiple head shots (35). Depending on the case, it may be prudent to fix the brain in formalin prior to sectioning, in order to document the wound pathways as well as possible. It is also vitally important for forensic pathologists to check the oral and nasal cavities for concealed wounds in suspicious deaths ( $\frac{26}{2}$ ). As case 2 exemplifies, hair can also conceal wounds. The identification of multiple GSWs of the head should raise concern about the possibility of homicide. If more than one wound pathway produces injuries that would be considered instantaneously incapacitating, the evidence argues strongly against suicide, as exemplified in case 2. A corollary to this concept has important implications in all of the cases presented in this report. Specifically, recognition that the wound pathways were incompatible with subsequent purposeful movement was key in identifying each case as a homicide. In case 1, there was no possible way that the victim could fold his hands after shooting himself in the head. In case 2, there was no way that the victim could shoot herself in the head twice, as each individual shot would have been incapacitating. In case 3, there was no way that the victim could have fired another shot through the door after sustaining the GSW of his head.

## Death Investigation and Scene Investigation

The presented cases also highlight the importance of death investigation and scene investigation

11/22/2023, 3:03 PM

in GSW cases, as aspects of the investigation frequently involve police as well as death investigator office personnel. Obtaining and documenting circumstance and scene information, including witness statements, can be extremely important. This can be especially useful when attempting to correlate autopsy findings and/or scene findings with subsequent reconstruction of events. In case 1, had the victim's folded hands not been documented (and if body transport personnel had unfolded his hands), the case would have been considered a suicide. In case 2, identification of the letter contradicting the horse kick story provided an increased level of suspicion that the case might not represent a suicide. In case 3, the discovery of pieces of door fragments on top of the already injured/dead body and blood pools were of incredible importance in disproving the wife's original story.

## Summary

In conclusion, scene investigation and forensic autopsy are of great importance when confronted with deaths suspected of foul play. It is essential for death investigators to gather good information, witness statements, and to closely make note of the scene and body. In order to determine the correct MOD, correlation of autopsy evidence, investigative information, and scene evidence is vital. It is important to recognize that, with few exceptions, GSWs through the brain should be considered instantaneously incapacitating, such that volitional movement following such an injury is not possible. Recognizing the physical impossibility of findings is also of paramount important, both in relation to the decedent, as well as the scene. These facts were key components in the cases presented, allowing the forensic pathologists to opine without question that the cases represented homicides. Subsequent investigation in each case confirmed that each did, in fact, represent a homicide.

#### **AUTHORS**

**Samuel P. Prahlow**, MS, Medical Student (OSM-I), Philadelphia College of Osteopathic Medicine-South Georgia, Moultrie, GA

Stephen Cohle, MD, Kent County Medical Examiner's Office

Brandy Shattuck, MD, Western Michigan University Homer Stryker M.D. School of Medicine

Joseph A. Prahlow, MD, Western Michigan University Homer Stryker M.D. School of Medicine



### **Footnotes**

**Statement of Human and Animal Rights:** This article does not contain any studies conducted with animals or on living human subjects.

Statement of Informed Consent: No identifiable personal data were presented in this manuscript.

**Authors' Note:** A portion of this manuscript was presented at the 2017 Annual Meeting of the National Association of Medical Examiners as a poster presentation.

**Disclosures & Declaration of Conflicts of Interest:** The authors, reviewers, editors, and publication staff do not report any relevant conflicts of interest.

**Financial Disclosure:** The authors have indicated that they do not have financial relationships to disclose that are relevant to this manuscript.

#### References

- 1. Prahlow JA, Linch CA. A baby, a virus, and a rat. *Am J Forensic Med Pathol*. 2000;21:127–133. [PubMed] [Google Scholar]
- 2. Prahlow SP, Arendt A, Cameron T, Prahlow JA. Accidental trauma mimicking homicidal violence. *J Forensic Sci.* 2016;61(5):1250–1256. [PubMed] [Google Scholar]
- 3. Prahlow JA, Davis GJ. Death due to cocaine intoxication initially thought to be a homicide. *South Med J.* 1994;87(2):255–258. [PubMed] [Google Scholar]
- 4. Prahlow JA, McClain JL. Lesions that simulate gunshot wounds. J Clin Forensic Med. 1997;4(1):21-126. [Google Scholar]
- 5. Prahlow JA, McClain JL. Lesions that simulate gunshot wounds—further examples II. *J Clin Forensic Med*. 2001;8(4):1–8. [PubMed] [Google Scholar]
- 6. Oliver W, Fudenberg J, Howe JA, Thomas LC. Cognitive bias in medicolegal death investigation. *Acad Forensic Pathol.* 2015;5(4):548–560. [Google Scholar]
- 7. Oliver W. Inference in forensic pathology. Acad Forensic Pathol. 2011;1(3):254–275. [Google Scholar]
- 8. Ohshima T, Kondo T. Eight cases of suicide by self-cutting or -stabbing: consideration from medico-legal viewpoints of differentiation between suicide and homicide. *J Clin Forensic Med*. 1997;4(2):127–132. [PubMed] [Google Scholar]
- 9. Durak D, Fedakar R, Turkman N. A distant-range, suicidal shotgun wound of the back. *J Forensic Sci.* 2006;51(1):131–133. [PubMed] [Google Scholar]
- 10. Prahlow JA, Long S, Bernard JJ. A suicide disguised as a homicide: return to thor bridge. *Am J Forensic Pathol.* 1998;19(2):186–189. [PubMed] [Google Scholar]
- 11. Wu C, Reichard RR. Elaborate suicide attempt in the style of Sherlock Holmes mystery—"the problem of thor bridge". *Acad Forensic Pathol.* 2011;1(1):143–143. [Google Scholar]
- 12. Pelletti G, Visentin S, Rago C, et al. Alteration of the death scene after selfstabbing: a case of sharp force suicide disguised by the victim as a homicide? *J Forensic Sci.* 2017;62(5):1395–1398. [PubMed] [Google Scholar]
- 13. Austin AE, Guddat SS, Tsokos M, et al. Multiple injuries in suicide simulating homicide: report of three cases. *J Forensic Leg Med*. 2013;20(6):601–604. [PubMed] [Google Scholar]
- 14. Poulos CK, Thorne TA. A unique case of attempted two gun suicide with one firearm discharge and two muzzle imprints. *Acad Forensic Pathol.* 2013;3(2):250–253. [Google Scholar]



- 15. White DT, Chrostowski L, Adams VI. Suicide by extraordinarily numerous blade wounds. *Acad Forensic Pathol.* 2011;1(1):138–142. [Google Scholar]
- 16. Amararatne RS, Vidanapathirana M. A crime scene fabricated as suicide. *J Clin Diagn Res.* 2017;11(2): HD01–HD03. [PMC free article] [PubMed] [Google Scholar]
- 17. Zietlow C, Hawley DA. Unexpectedly homicide: three intraoral gunshot wounds. *Am J Forensic Med Pathol*. 1993;14(3):230–233. [PubMed] [Google Scholar]
- 18. Aggrawal A, Pradhan M, Sreenivas M. Nail injury to the brain obfuscated by a fall from height—homicide or suicide? A case report. *Med Sci Law*. 2015;55(1):40–43. [PubMed] [Google Scholar]
- 19. Sauvageau A. True and simulated homicidal hangings: a six-year retrospective study. *Med Sci Law*. 2009;49(4):283–290. [PubMed] [Google Scholar]
- 20. Rogalska A, Thompson J, Baker AM. The perfect murder: how a suicide became a homicide. *Acad Forencis Pathol*. 2015;5(3):481–491. [Google Scholar]
- 21. Molina DK, DiMaio VJ. Rifle wounds: a review of range and location as pertaining to manner of death. *Am J Forensic Med Pathol.* 2008;29(3):201–205. [PubMed] [Google Scholar]
- 22. Molina DK, DiMaio VJ, Cave R. Gunshot wounds a review of firearm type, range, and location as pertaining to manner of death. *Am J Forensic Pathol.* 2013;34(4)366–371. [PubMed] [Google Scholar]
- 23. Molina DK, DiMaio VJ, Cave R. Handgun wounds a review of range and location as pertaining to manner of death. *Am J Forensic Med Path.* 2013;34(4):342–347. [PubMed] [Google Scholar]
- 24. Druid H. Site of entrance wound and direction of bullet path in firearm fatalities as indicators of homicide vs suicide. *Forensic Sci Int.* 1997;88(2):47–162. [PubMed] [Google Scholar]
- 25. Berens S, Ketterer T, Kneubuehl BP, et al. A case of homicidal intraoral gunshot and review of literature. *Forensic Sci Med Path.* 2011;7(2):209–212. [PubMed] [Google Scholar]
- 26. Azmak D, Altun G, Koc S, et al. Intra- and perioral shooting fatalities. *Forensic Sci Int*. 1999;101:217–227. [PubMed] [Google Scholar]
- 27. Hanzlick R. A perspective: gun-related fatalities and manner of death. *Acad Forensic Pathol.* 2013;3(2):171–182. [Google Scholar]
- 28. Kury G, Weiner J, Duval J. Multiple self-inflicted gunshot wounds to the head: report of a case and review of literature. *Am J Forensic Med Pathol.* 2000;21(1):32–35. [PubMed] [Google Scholar]
- 29. Marnerides A, Zagelidou E, Leontari R. An unusual case of multiple-gunshot wound suicide of an alcohol-intoxicated cancer sufferer with prolonged physical activity. *J Forensic Sci.* 2013;58(2):537–539. [PubMed] [Google Scholar]
- 30. Henja P, Safr M, Zatopkova L. The ability to act-multiple suicidal gunshot wounds. *J Forensic Leg Med*. 2012;19:1–6. [PubMed] [Google Scholar]
- 31. Arunkumar P, Maiese A, Bolino G, Gitto L. Determined to die! Ability to act following multiple self-inflicted gunshot wounds to the head. The Cook County Office of medical examiner experience (2005-2012) and review of literature. *J Forensic Sci.* 2015;60(5):1373–1379. [PubMed] [Google Scholar]
- 32. Sekula-Perlman A, Tobin JG, Pretzler E, et al. Three unusual cases of multiple suicidal gunshot wounds to the head.

Am J Forensic Med Pathol. 1998;19(1):23-29. [PubMed] [Google Scholar]

- 33. Hudson P. Multi shot firearm suicide: examination of 58 cases. *Am J Forensic Med Path.* 1981;2(3):239–242. [PubMed] [Google Scholar]
- 34. Di Maio VJ. Bloody bodies and bloody scenes In: Di Maio VJ, ed. *Gunshot Wounds Practical Aspects of Firearms, Ballistics, and Forensic Techniques*. 3rd ed CRC Press; 2016. [Google Scholar]
- 35. Aesch B, Lefrancq T, Destrieux C, Saint-Martin P. Fatal gunshot wound to the head with lack of immediate incapacitation. *Am J Forensic Med Path.* 2014;35(2):86–88. [PubMed] [Google Scholar]