

Atypical Firearm Wounds, One Projectile Leading to Multiple Injuries: Correct Interpretation and Correlation

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Abstract

In the practice of Forensic medicine, firearm injuries cases pose a challenge, particularly those caused during the police/armed forces action also known as 'Encounter'. Autopsy reports play a very important role in recreation/reconstruction of the event and are an important evidence for review by other agencies. The track of the wounds, direction of firing, site of entry and exit wounds along with other internal injuries are used to authenticate and verify the version of police officers. Authors have observed that in certain cases of death consequent to firearm injury, sometimes atypical wounds are found which may be difficult to interpret at the time of performing autopsy. A meticulous postmortem examination coupled with cautious analysis and interpretation of injuries has to be done before furnishing a Medico legal opinion in such cases. The authors report such a case in which an atypical firearm wound was found in a police encounter case. The case is being reported only for academic purposes to highlight the importance of correct interpretation in such atypical wounds by a meticulous autopsy examination so as to prevent any further doubts in their correlation with sequence of events. Modern radiological techniques like Digital X-ray and PM MSCT should be used in firearm cases to enhance the objectivity and credibility of postmortem findings.

Keywords: Firearm injuries; Encounter Deaths; Gunshot Wounds; Post Mortem Multi slice Computed Tomography.

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Introduction

In the practice of Forensic medicine, autopsy surgeons frequently come across the cases of death due to firearm injuries in the normal course of duties. Many of such cases pose a challenge, particularly those caused during the police/armed forces action also known as 'Encounter'. These encounter cases are always disputed by the relatives of the persons killed in the police action.^{1,2,3} These cases may be subjected to reinvestigation/review by other agencies like Central Bureau of Investigation, National Investigating Agency, and Honorable Courts of law.⁴ Police encounter cases are mandatorily reviewed by National Human

Rights Commission (NHRC). NHRC has framed a separate procedure for conducting inquest and performing autopsies in such shoot out cases.⁵ Autopsy reports play a very important role in recreation/reconstruction of the event and are an important evidence for review by other agencies. The track of the wounds, direction of firing, site of entry and exit wounds along with other internal injuries are used to authenticate and verify the version of police officers. Authors have observed that in certain cases of death consequent to firearm injury, sometimes atypical wounds are found which may be difficult to interpret at the time of performing autopsy. Identification of the wounds,

track of the bullet and recovery of the bullet may throw serious challenges as sometimes the findings may not match with the version of police personnel. Thus a meticulous postmortem examination coupled with cautious analysis and interpretation of injuries has to be done before furnishing a Medico legal opinion in such cases. The authors report such a case in which an atypical firearm wound was found in a police encounter case. The case is being reported only for academic purposes to highlight the importance of correct interpretation in such atypical wounds by a meticulous autopsy examination so as to prevent any further doubts in their correlation with sequence of events.

Case Report

The limited details of the case will only be shared for maintaining the confidentiality and also as the case may be under judicial proceedings/enquiry. Minimal relevant Autopsy findings are being mentioned to fulfill the objective of the Academic deliberation and for addition to the Medical Literature. The external findings, clothing examination, other firearm injuries over the body and internal injuries will not be disclosed.

The deceased was a young adult male, who sustained firearm injuries in a Police encounter. He was declared as brought dead in a hospital. Autopsy was conducted under Videography by a Medical Board, as per the established protocol. Deceased was subjected to X-rays examination to check for the presence of any projectile in-situ and the result was negative.

While correlating the wounds based on the presence of features of entry and exit wounds, it was concluded that a single bullet has caused four external injuries which are not lying on the same line when the head is kept in anatomical position (as marked by a red arrow in Fig 1A). Two bullet-grazed reddish abrasions (A&B) are noted which are placed obliquely directed downwards (Fig 1B).



Fig. 1: (A&B).

One is present on the right side of neck involving the mandibular region along the outer aspect of floor of the mouth and the second one is present involving the right infra clavicular region. Both

the wounds correspond to each other upon flexing the head towards right side. The wound tract is running obliquely downwards and medially towards left side. An entry wound with abrasion collar towards the right side is present over the inner aspect of the left chest and exiting along the outer and lower aspect of the left chest traversing along the subcutaneous plane. The underlying soft tissues were contused devoid of any rib fractures. The above mentioned four injuries (A, B, C, D) were in a single line when the deceased head was flexed over the right side of chest. Hence it was concluded that the projectile travelled from above downwards at the time of shootout.

Discussion

Atypical firearm wounds have the potential for multiple issues of wrong interpretation. Knights et al had illustrated a case where there was a single entry wound over the left temple and two exit wounds over the right temporo-parietal region which was caused by a .22 rifle. The two bullets that had entered the skull through a single-entry wound had diverged inside the skull to exit through the two exit wounds. At times there may be there may not be an exit wound but bullet may be recovered from the clothing.⁶

Atypical entry wounds comprise of the graze and the tangential wounds. The graze wound is produced by the passage of the projectile across the skin surface, causing a superficial wound with little penetration to the skin. The wound appears shallow and elongated with a gutter. In majority of such cases, there is a degree of taper at each end which gives a symmetrical configuration. The presence of peripheral abrasion rims in these wounds is not the same in all cases. A small skin split helps in commenting upon the direction of entry. The depth of the wound varies according to the movement of the projectile and might create confusion in deciding whether it is a first contact or exit.⁷

In tangential firearm wounds the projectile contacts the skin at an angle. They are deeper than the graze wounds produced during the motion of the bullet. These wounds are asymmetrical in appearance and margins are ragged and torn. These tear and split lacerations guide the Medical examiner in concluding the direction of the projectile as in our case. There is extensive tissue loss in case of high velocity tangential wounds.⁷ Our case report illustrated atypical entry wound with the presence of graze wounds and tangential wounds with presence of contusion, furrowing,

skin splits and tears. The above-mentioned findings helped us to conclude the relative position of the deceased as mentioned above. It also illustrates that the formation of atypical wound depends on the relative position of the individual.

A single bullet has caused a total of five injuries which helped in correlating the relative position of the victim. The five injuries listed are four external injuries i.e. the two grazed abraded contusion, an entry wound with an exit wound, contusion of the intercostal muscles. In an another case reported by Singh V P et al, a single bullet has caused five wounds based on which they concluded the possible position of the victim.⁹ The incidence of such type of cases is prevailing but with a lesser frequency. A study by James et al regarding the Firearm deaths by law enforcement in United States found that almost more than 50% of the deaths involved more than two or more entry wounds.⁹ Our case findings were in accordance with James et al. Studies suggest that in cases of involvement of multiple wounds, head is considered to be the most predominant site after chest.¹⁰⁻¹² However this finding of comparative study can't be commented/ cited upon, due to confidentiality issues.

The authors find it pertinent to mention the importance of use value of radiological techniques in such cases. Currently 2-D digital X-ray examination is used to study the wound ballistics and locate the bullets/projectile. In case of X rays more than two views are needed to localize the foreign body. The decomposition changes and maggot infestation can alter the wound morphology of such atypical firearm wound. The usage of Post Mortem Multi slice Computed Tomography (PM MSCT) in Gunshot cases will be better in interpreting the findings as compared to the X rays.^{13,14}

Conclusion

These types of cases are a real challenge to the forensic experts on the autopsy table. The key to solve such cases is the correct observations and application of mind to correlate the injuries with the help of the features like abrasion collar, direction of minute skin tags and bullet graze etc. Modern radiological techniques like Digital X-ray and PM MSCT should be used in firearm cases to enhance the objectivity and credibility of postmortem findings. The presence of three dimensionality in PM MSCT makes it possible to exact the location and recovery of projectile and avoids the tedious search of the assumed bullet interpreted in 2-D X rays.

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