

'Double Tap' Gunshot Injury to the Head: A Case Report and Review

Pawan Mittal^{1*}

¹Department of Forensic Medicine, Bhagat Phool Singh Medical College for Women, Khanpur Kalan-131305, Sonapat, Haryana, India

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*Corresponding author: Pawan Mittal

Abstract

Case Report

Atypical gunshot injuries are not very common findings in routine autopsies. A case of gunshot wound to the head is herein reported where two rapid successive shots from a double tap firing lead to a unique patterned injury over the occipital region of the skull. Differentiation from the tandem/piggyback shot was necessary and was made on the basis of wounds' appearances and detailed circumstantial information. A review of the tandem bullet phenomenon in this regard was made and also a few cases belonging to the finding of double tap gunfire in forensic pathology as well as anthropological contexts were studied in details. The pathologist must be aware of both of the phenomena due to their close relation, in order to fully elucidate the autopsy findings, attesting the witness testimony and the facts relating to a legal investigation.

Keywords: Gunshot; wound; tandem; fracture; range.

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INTRODUCTION

The investigation of a gunshot death often presents a challenge to the forensic pathologist. The autopsies in gunshot wound (GSW) death cases are important in that they reveal information and evidence about how the crime was committed [1]. In fatal gunshots, a number of well-described circumstantial parameters, such as an atypical anatomical location of the bullet, unusual firearm or ammunition used, as well as the ambiguous autopsy findings can raise doubts about the manner of death [2, 3].

The forensic pathologist needs an in-depth knowledge and vast practical experience to handle cases that appear to be outside ordinary experience [4]. All available data from the death scene investigation, radiological and laboratory analyses and, in particular, autopsy findings have to be considered in order to reconstruct the events prior to death and to accurately determine the manner of death [1, 5].

It is further important for the clinicians and forensic pathologists to be aware of the spectrum of both typical and atypical or unusual ballistic injuries which may be encountered during examination of the gunshot victims [4].

A case of GSW to the head is described where a rapid successive firing of two shots, i.e., 'double tap'

GSW, over the occipital region of head resulted in a unique patterned entrance wound over the skull.

CASE REPORT

History and Crime scene Details

The case belongs to a 30 years old young male who had an old dispute with two male fellows who resided in the next street. A quarrel ensued between them in the street openly during an afternoon. One of the culprits was in possession with a semiautomatic handgun. After having a little manual scuffle, three shots were fired at the victim. According to the witness testimony and police theory, the victim was first given multiple hits over the head with the grip of the gun which was then followed by gunfire at his face from the front. Subsequently, two additional shots were fired in quick succession at the back of his head as he kneeled down on to the ground. The culprits fled away while the victim expired on the spot after a little fuss. One intact and two fragmented jacketed bullets along with corresponding rifled cartridges were recovered from the scene. The dead body was brought for postmortem examination next day morning.

Autopsy Findings

X-ray of the skull revealed few radio-opacities which were recovered as lead and jacket fragments during autopsy. The following injuries were noticed:

1. Two wedge-shaped reddish impact abrasions over left frontal scalp region just above the eyebrow,

with slightly depressed and parched smooth surface; consistent with the direct and perpendicular blunt impacts.

2. A tangential GSW of 8.5 cm x 1.0 cm was present over left side of the face. Powder tattooing was present over left side of the face (Figure-1). The abraded cap of the wound was towards the cheek which along with the margins and floor of wound was greasy and sooted black. Tiny marginal tears were pointing towards the base, i.e., towards muzzle side thereby suggesting a front to back trajectory with a close to intermediate range.
3. Upon cleaning and shaving of scalp, two adjacent and almost coalescing oval firearm entrance wounds, each of 7 mm x 5 mm were present over right occipital scalp region, just above nape of the neck and separated in between by a contused band of skin of width 4 mm.

A symmetrical zone of dense powder tattooing along with a little soot surrounded the wounds. The scalp layers were hemorrhagic along with diffuse subgaleal hematoma. The underlying squama of right occipital bone showed two adjacent oval punched-out lesions over outer table, along with a horizontal band of intact skull of 2 mm in-between. A secondary radiating fracture was running from the middle of superior wound while it was absent for the lower wound. The inner table of skull depicted corresponding lesions within right cerebellar fossa that depicted a unique 8-shaped configuration along with intervening horizontal band of beveled skull (Figure-2). Complete circumferential inner beveling was present around the lesion that was more wide and prominent along its lateral-medial-anterior margins while width varied from 2 to 10 mm at places. Furthermore, it could be observed that the lateral and medial arches of this lesion were slightly flattened and straight in comparison with the upper and lower borders that were more concave in character.

The wounds tracked through basal brain almost shattering and riddling the cerebella, bilateral temporal lobes, corpus callosum and the midbrain. The track roughly measured 12 cm x 8 cm while taking an almost straight and slightly upward course. Individual bullet tracks could not be made out due to the massive brain destruction that ensued. The right petrous ridge revealed a large fracture defect. An exit facial defect was present over right maxilla with extensive comminution of the bony region and splitting of facial tissues over right cheek. The stellate-shaped exit wound measured 8 cm x 6.5 cm.



Fig-1: A close to intermediate range tangential GSW over left side of the face, directed from front to back. Two impact abrasions over left frontal scalp regions are present, indicative of ‘pistol whipping’



Fig-2: Inner table over right occipital squama showing two coalescent bullet holes with an 8-like figure, along with surrounding and intervening inner table beveling (a ‘double tap’ shot)

DISCUSSION

The atypical cranial findings in the gunshot injuries are many. These mainly include external bevel/flaking over entrance wound [6], internal beveling of exit wound [7], gutter wounds [8], exit bone plug [9], interrupted beveling [10], and the keyhole lesion [11].

In a similar manner, cases of ‘tandem shot’ (also known as piggyback bullets) [1, 4, 5, 12], as well as the rarely occurring incidents of “double tap” GSW are on forensic records [13-15]. However, both of these phenomena require a careful differentiation in order to elucidate the circumstances of the case, particularly the number and sequence of shots.

Tandem Shot/Piggyback bullet

Tandem shot refers to the multiple bullets firing through the barrel in a “piggyback” fashion/in “tandem” and gaining entrance into the body either through a single or multiple wounds [1, 12]. The staying of initial bullet in the barrel is attributed to the failure of ignition to create sufficient discharge speed which is usually due to insufficient propellant and loss of its ignition characteristics as happens in oil infiltration and chemical breakdown of the gunpowder

with passage of time [15]. Using homemade cartridges and projectiles also increase the chances of ignition failure [16]. In such cases, the base of the bullet located in front is concave and flayed while the tip of the bullet over back is flattened and bent backward (a piggy-back arrangement). Such entry wounds would still be discernable as such, although they usually have irregular shapes [12, 17].

Tandem cases involving combinations of ballistic and non-ballistic projectiles have been also reported. Simultaneous entrance of the ballistic projectile(s) along with barrel cleaning brush, as well as nail and a screw are on records [18, 19].

Jentzen and colleagues reported a case in which three projectiles entered the head through the same wound over the right temple, lodging into the right temporal lobe. However each projectile was fired separately. The facts were proved by finding three different muzzle impressions around the wound, as well as from lack of piggyback arrangement on the projectiles [20].

Similarly cases of tandem projectiles involving simultaneous lodgments of bullets and cartridges through different entrances within the body have been described [4, 12]. In the case reported by du Toit-Prinsloo, the projectiles in tandem entered through two different adjacent entrances over the chest wall. The autopsy as well as ballistic examination of the projectiles confirmed the piggyback arrangement [12].

The tandem projectiles usually demonstrate unstable flight ballistics and can result in a multiplicity of injury outcomes on the bodies of victims, including multiple and irregular entrance gunshot wounds, which may complicate the interpretation of findings and impact on subsequent legal proceedings [15, 21, 22].

Double tap shot

The term 'double tap' refers to a tactical shooting technique in which the trigger is pulled in a quick succession allowing two shots to be fired in the same target zone [13]. The shots usually cluster within 1–2 in. of each another [14]. As with tandem shots, double tap shots rarely occur in forensic cases. The shots are executed with a semiautomatic weapon, most likely a pistol.

The entrance morphology of a double tap may be an 8-shaped defect, in which two coalescing, rounded defects are formed devoid of the lateral and medial arches [13]. The endocranial surfaces exhibit internal beveling, maintaining its unique contours and shape.

Although the shots enter through roughly the same area, they usually take separate wound tracks and do not exit at the same location [13, 14].

However, few cases have been described in which more than one bullet exited through the same hole. De Giorgio and Rainio described two shotgun pellets converging in the chest wall [23]. In another case reported by Hiss and Kahana, two different projectiles entering through the back, traveled toward each other with a decreasing angle and exited through the same defect [22].

Two instances of double tap firings to the skull have been described in the context of Human Right Abuse (HHRR) by Kimmerle and Baraybar. In the first case, both of the wounds were coalesced forming common arches and 8-shaped figures with internal beveling as well as the external delamination [13]. The wounds exited through a large diamond shaped defect situated over the frontal bone. In the other case described subsequently, two adjacent gunshot injuries present over left temporal and occipital regions of skull and stated to be fired in an execution style, exited through a defect over left orbit [13]. DiMaio has described a similar case showing two adjacent contact wounds of the body suffered from .22 LR cartridges, with each wound showing searing and blackening of the edges along with a common band of intact skin in-between; the wounds together depicted an overall 8-shaped appearance [15].

The Present Case

In the present case, a clean delineation of the bullet paths and the exits could not be made on account of massive intracranial destruction but the typical morphology of entrance wounds along with circumstantial details pointed to a 'double tap shot' phenomenon. The nearly merging wounds caused an 8-like figure over the inner table. Despite the beveling and alteration over inner table of the skull, the general contours and shape of the lesion were well maintained. A symmetrical confluence of wounds over the outer table was also in-line with the phenomenon.

The double tap firing was additionally already evident from the witness statements as well as the type of arm (semiautomatic handgun) used in inflicting the injuries.

The presence of soot deposit and powder stippling around the wounds was consistent with a close range firing [15]. A close range shot further increased the possibility of such pattern due to relative stability of the bullet trajectory. A uniform, round appearance of the entrance wounds over scalp and skull along with a regular pattern of powder tattooing and soot deposits, further ruled out a tandem or atypical projectiles' entrances into the cranium.

Regarding the sequence of gunshots, it was most likely that the upper wound was inflicted first in the present case followed by the lower, due to lack of a relief/secondary fracture in the lower injury [24].

Overall the autopsy findings were helpful in attesting the witness statements and circumstantial information provided by the investigation authorities that two separate firings in rapid progression had been made at a close range over the victim's back of the head.

CONCLUSION

The atypical and unique appearances of gunshot injuries such as tandem shots and double tap fires must be carefully interpreted and differentiated in order to fully establish the circumstances of the case. Given the range of firearms and the modifying variables that influence the wounds they create (e.g., the distance of fire or size of ammunition), correctly interpreting the soft tissue and skeletal ballistic defects requires a basic understanding of firearms and wound ballistics. A sound understanding of such type of wound defects may be helpful in linking the crime to the possible weapon as well as the range of gunshot discharge.

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