https://doi.org/10.15218/zjms.2025.061

Shotgun pellets accidental chest trauma: A case report

Received: 23/09/2024 Accepted: 24/10/2024

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Abstract

Shotgun is the main gun used for bird hunting in rural and mountain area in the Kurdistan Iraq. This type of weapon typically acts at thirty-meter distance accuracy. Shotgun pellet-related accidents donot happen very often. Shotgun bullets have a propensity to fragment into pellets when they strike an object diagonally or after a predetermined distance. In addition to lead, steel, tungsten, and bismuth pellets are also utilized to make these pellets.Regarding the removal or retention of foreign objects like the pellets, there is no agreement. These pellets possess the capability to access distant organs that are difficult to reach by surgical intervention. This kind of situation primarily results in fatalities due to significant damage to internal tissues and organs.

In this report, we present 16 years old male teenage who died due to accidental shotgun shot from very close range in the chest area,the pellets got spread inside his chest**.** Our victim was unintentionally shot at close range, impacting the middle of his chest tangentially.

Keywords: Shotgun Pellets; Injury of the body.

Introduction

In the Kurdistan region of northern Iraq, shotgun injuries are less common due to the stringent regulations on firearm acquisition. Nonetheless, they are utilized in the rural regions of Iraq for hunting purposes. Although they may sometimes be inadvertently caused, suicide attempts constitute the predominant source of injury among casualties.

Injuries from close quarter's shotguns are typically more harmful than those from handguns.(1)

Worldwide, shotguns are more prevalent than rifled firearms and remain in significant demand. Traumatologists must possess expertise in shotgun wound ballistics owing to the increasing prevalence and severity of gunshot injuries. Because the pellets disperse as they fly, shotgun wounds have a wider range of severity than those caused by other projectiles. While shotgun wounds at close range can be just as devastating as those from a high-velocity rifle, injuries from larger weapon-victim ranges may only be slightly caused.(2)

There is less secondary projectile damage as the firing range expands. The shotgun pellets won't have time to disperse and enter the body as a single mass if they are fired during a close-range shot of less than 30 cm. Pellets may disperse as their range grows. Birdshot guns injuries are mostly dangerous and deadly and determined by the "effective" weapon-victim range, which may be determined clinically or by X-ray analysis of the shot size and pattern.(3)

The severity of the wounds may then be used to classify them, providing information on the prognosis as well as the amount of further testing and care that may be needed. Definitive management of victims with shotgun injury is controversial and may depend on the site and organ areas of shooting impact, nature of the weapon,

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and close or far fire distance.[4] There was no similar cases in Erbilcity, our victim was shot accidentally at close range, striking his middle chest tangentially. This caused the pellets to travel throughout his chest cavity, causing various damages to his lungs and heart.

Case report

A16 years old male teenage who was referred from Emergency hospital in Erbil city was received in Medicolegal directory with suspected history of accidental triggering of shotgun when he was mistakenly shot himself during gun cleaning process. He received a single bullet impact on his middle area of the chest and the inlet of the bullet measured size around 2cm in diameters with appearance of burn around bullet inlet (Figure 1&2).

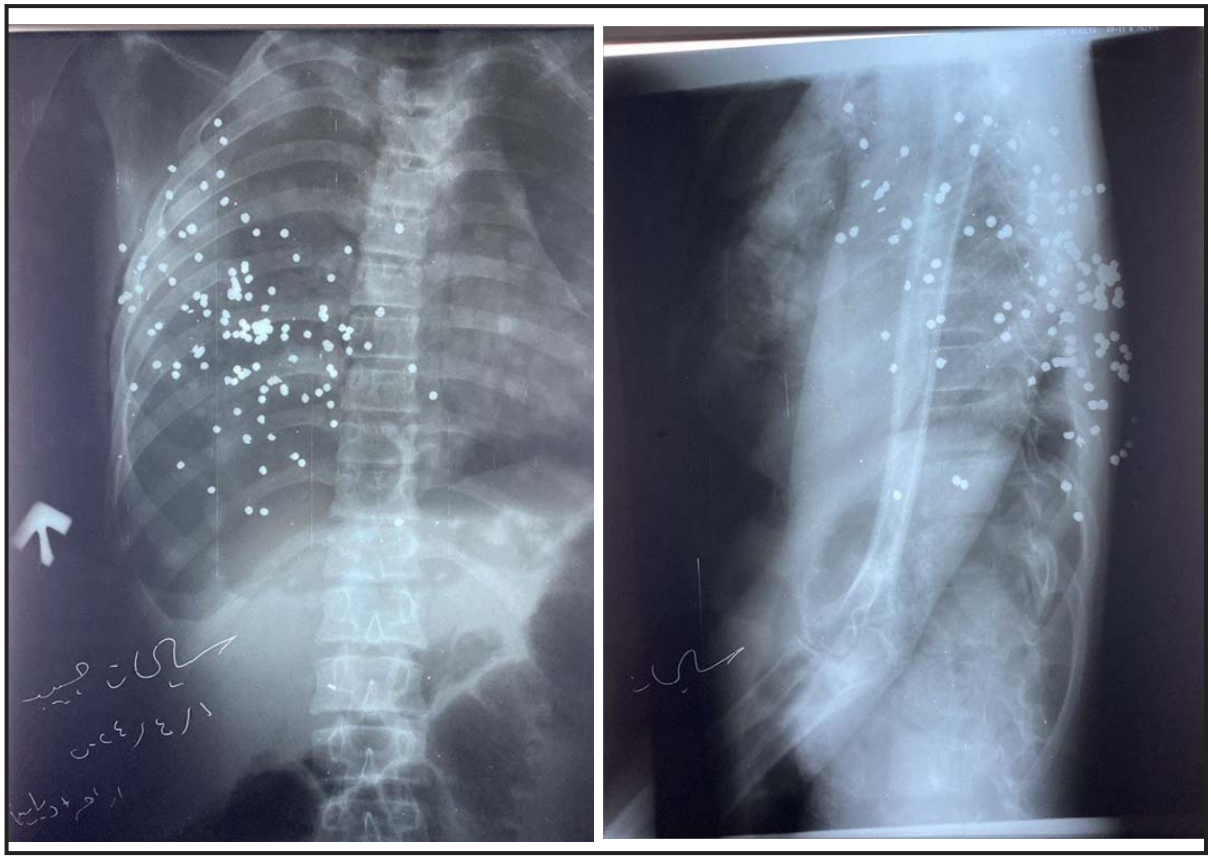

Figure 1 X-Ray AP and LAT view of chest wall

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Figure 2 Inlet of the bullet with the (soot ring)

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Upon the victim's arrival, he was undergoing examination; the central region of his chest had a solitary bullet entrance wound, accompanied by hemorrhaging from the mouth and nose (Figure 3).

A subsequent postmortem investigation was conducted to ascertain the internal damage to the body. The primary damage within the chest cavity was observed in the lungs, which exhibited severe injury, many tears, and significant deposit of clotted blood. Moreover, the diaphragm sustained no injury from any projectiles. Nonetheless, the heart sustained greater damage than the lungs from the pellets. Multiple lesions and tears with the deposition of clotted blood were observed in the pericardium, myocardium, valves, arteries, and veins, Figure 4.

Figure 3 A-Bleeding in the mouth and nose B- Inlet of the bullet with the (soot ring)

Figure 4 Circular wound, Tattoos and blackening are clearer like (soot ring)

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Discussion

Shotguns are considered the smooth-bored firearms. It may shoot a charge of slots, slugs, or a single ball. The barrel is a hollow cylinder that has an opening at the muzzle end and a closed breech end at the rear. Its length ranges from 55 to 72 cm. It might have a single barrel or two barrels. There are three components to the barrel's interior: first the chamber is to accommodate the cartridge, second the taper is to connect the chamber to the bore, third the bore which located in between taper and the muzzle. Bore ranges for shotguns are 4 to 20. 12, 16, and 20 gauges are the most often utilized ones. Cylinder bore refers to a barrel that has the same diameter throughout, from the breech to the muzzle. Choke bore is a term used to describe varied degrees of narrowness at the distal 7 to 10 cm of the barrel. Choking enhances explosive force and velocity while decreasing the pace at which shot spreads after exiting the muzzle. Shotguns have a 30-meter effective range.[5]

A small metal cylinder case makes up a shotgun cartridge. Because to its rim, the cartridge is kept correctly in the chamber and extraction is made easier. It holds the different parts in place, stops gasses from escaping backward, and gives gunpowder a watertight container. From the base, it is filled with percussion cap, gunpowder, thick feeling wad with cardboard disc behind and in front of it, shot, and a retaining cardboard disc that is forced up against the walls of the cartridge cylinder. In order to keep the expanding gasses from escaping and upsetting the shot charge, wad functions like a piston and completely closes the bore, allowing the ideal pressure to build. Grease from the felt wad lubricates the barrel upon each fire. Certain cartridges have a power piston that, at close range, helps to the wound by holding the shot within a polythene cup.[6]

Shotguns that are used for large game hunting employ rifled slugs, which are single missiles. The range of these slugs is far larger than that of pellets. The marks on the cardboard discs that are kept can be used to approximate the quantity of pellets. Pellets for small game are pellets 10, size 0.33; pellets for medium game are pellets 8, size 0.36; pellets for large game are pellets 6, size 0.36; and for birdshot (200–400) and dust shot (2000–3000). Because of the friction created when pellets brush against the interior of the barrel, they deform quickly. The pellets may fuse and melt as a result of the heat.[7]

Wound from shot guns and the firearm itself, size of the shot, type of explosive used, and the distance from which the weapon is fired all affect the nature of a wound. Close range injuries in distance of up to one meterlike a contact wound, it is a single, circular wound. Tattoos and blackening are more extensive. The margins might be perfectly straight or somewhat jagged. The tissues around the wound are singed with flame, darkened with smoke, and tattooed with unburned or partially burned powder grains if the distance is less than 30 cm. Smudging, fouling, or blackening are terms used to describe smoke deposits that can be removed using a moist cloth. Unburned powder particles cause stippling, peppering, or tattooing, which adheres to the skin superficially and can be cleaned with a wipe. The hair on the limbs and trunk surrounding the wound burns.[8] The keratin in hair melts in response to heat and solidifies upon cooling, giving the illusion of being clubbed, as the distance rises. Carbon monoxide absorption may cause the tissues up to 30 centimeters along the track and surrounding the incision to become cherry red. There can be a broad flare, a small rim of hyperemia, or even flame-related blistering. Range-related changes in blackening and tattooing intensity are accompanied by a reasonably regular spread increase. The wound's rim varies in length from 30 cm to 1 meter and has some scalloping, much like a rat hole. A tiny, round aperture measuring 3 to 4 cm in diameter with

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uneven and lacerated edges and no blackening, scorching, or variations in cherry red is produced when the range between 60 and 90 cm is used. There are no visible tattoos on the victim's body. Once inside the body, the bullets disperse and seriously harm vital organs like the heart and lungs. This topic is not intended to cover other range injuries.

Conclusion

Our victim was shot accidentally at close range, striking his middle chest tangentially. This caused the pellets to travel throughout his chest cavity, causing various damage to his lungs and heart. The cause of death was not fully determined until all the details were known. In such close distance (less than 1 meter), the pellets won't be taken out of the body unless they cause symptoms that interfere with the person in our directory's regular activities.

Competing interests

The author declares that he has no competing interests.

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