

CASE REPORT

A bizarre death caused by an anti-aircraft bullet

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ABSTRACT

In 2009, towards end of the civil war with the Sri Lankan government, the Liberation Tigers of the Tamil Elam (LTTE) carried out a suicide mission using two light aircraft. Both planes were later shot down by anti-aircraft fire. A young girl living in the suburbs who was watching the incident died after sustaining injuries due to an anti-aircraft bullet. The bullet had entered the root of neck and was found inside the left chest cavity. Atypical firearm injury is an important issue in the practice of forensic medicine. Interpretation of the injury and determination of the manner of death are important areas a forensic pathologist should deal with. A fair knowledge about aero-physics and behaviour of falling bullets is necessary to deal with this type of case. The morbidity and mortality depends on the site of impact of the bullet. This is the first such case reported in Sri Lanka. Though it has occurred under extra-ordinary circumstances it highlights the importance of following instructions given to the public under such circumstances.

Keywords: Anti-aircraft fire, falling bullets, chest cavity, atypical Firearms

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INTRODUCTION

Stray bullet injuries are a unique subset of firearm related injuries. Most are unintended consequences of intentional violence. There are many instances where injuries and death are caused by anti-aircraft fire. Many such deaths were reported especially during the Second World War. The essence of air defence is to detect and destroy hostile aircrafts. The critical issue is to strike a target moving in three-dimensional space; an attack must not only match these three coordinates but must do so at the time the target is at that position. This means that projectiles either have to be guided to hit the target, or aimed at the predicted position of the target at

the time the projectile reaches it. However under these circumstances it is very likely that many bullet will miss the target and fly astray resulting in possible injuries and even death to general public.

CASE HISTORY

Towards the end of the civil war between the government and the Liberation Tigers of Tamil Elam (LTTE), on the night of 20th February 2009 the LTTE launched their first aerial suicide attack^{1, 2}. They launched the attack using two light aircrafts filled with explosives. However, the air defense system of city was activated when the two aircrafts entered the city limits³ and the power supply to the city of Colombo was cut, plunging the city into darkness^{1, 4}. Anti-aircraft fire struck one of the planes which crashed into the 12th floor of a high rise building^{3, 4}. The other aircraft attempted to retreat and was shot down near the airport by the Sri Lanka Air Force.³ This anti-aircraft fire resulted in the death of a girl some distance away from the point of fire.

The victim, a 14-year-old girl, accompanied by several others, was outside her home which was about 7.5km from Colombo fort watching the ongoing events. They were standing under a mango tree when the victim collapsed on to the ground. Others around were unaware of what happened, but subsequently noticed that the victim was injured

and took her to the emergency department. The girl was pronounced dead on admission.

AUTOPSY EXAMINATION

The body was that of an adolescent girl, averagely grown with brown skin complexion, clad in a T-shirt and a skirt. A 3X2 cm penetrating injury was noted at the root of the neck on the right side. It was irregular in shape with abraded margins. There was no burning, blackening or tattooing (Figure 1).



Fig 1: Entry wound

The right clavicle was fractured close to the sternoclavicular junction. The first and second right ribs were also fractured close to the sternum. The bullet track extended downward and medially involving the right subclavian artery, trachea, and oesophagus (Figures 2 & 3).

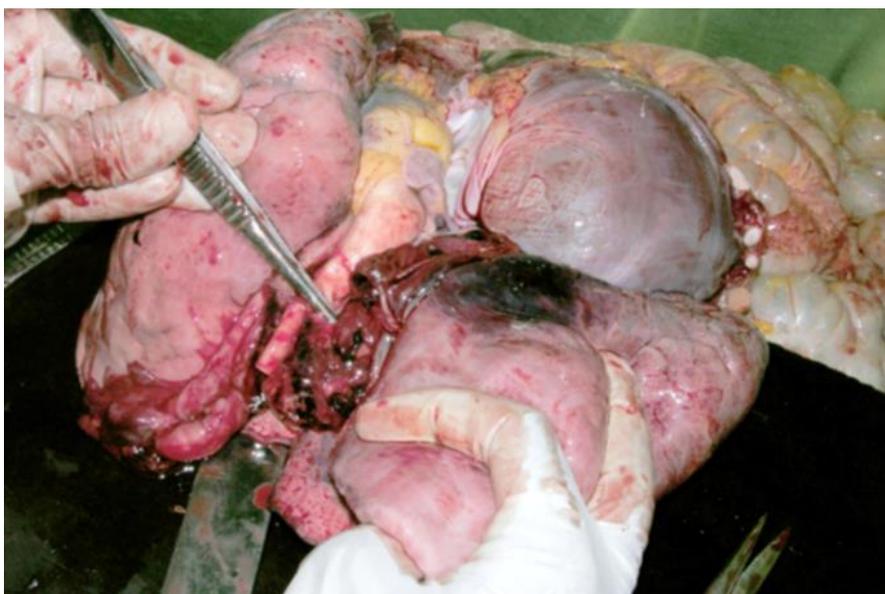


Fig 2: The tract of the bullet at the root of the neck



Fig 3: Injury caused to the subclavian artery, trachea, and oesophagus.

The tract extended to the left side, involving the left main bronchus and crossed the midline at the root of the neck. The right side of the chest cavity contained 800 ml of blood and left contained 150 ml. A 12.7 mm (0.5 inch) caliber anti-aircraft bullet was found in the left chest cavity (Figure 4). There were no other injuries. Length of the bullet was 14.2cm.



Fig 4: 12.7 mm bullet recovered from the left chest cavity

The cause of death was determined to be haemothorax following subclavian artery damage due to an anti-aircraft bullet.

DISCUSSION

Gunshot injuries are common in Sri Lanka. However, accidental death following anti-aircraft fire has never been reported. Horizontally or near horizontally traveling bullets will have higher kinetic energy than the bullets fired up into the air and traveling in a parabolic trajectory⁵. Bullets fired straight up will usually fall under the gravitational pull, and they possess the lowest amount of kinetic energy in comparison to the other two types⁵. However, in this case, we cannot classify the offending bullet as a falling bullet due to the circumstances under which it had been fired.

External injury, in this case, was at the root of the neck on the right side. Examination of the wound tract revealed it to be extending downwards, medial, and to the left. According to the parents, the deceased, was standing outside and looking up at the sky at the time of incident. Findings are consistent with a bullet falling from above. Could it be categorized as a falling bullet? In this case, the finding of a 12.7 mm bullet in the left chest cavity confirms that the bullet was discharged from an anti-aircraft gun. Facts revealed the reason for firing the weapon as to defend the city. In this case, though the exact direction of firing is not known, it is unlikely to be vertical or near-vertical. The distance between the probable location of the fire and the point of the incident is about 7.5 kilometers. Therefore this is likely to be a bullet traveling in a parabolic trajectory than a 'falling bullet' under gravitational pull.

When considering the trajectory of the bullet and the kinetic energy it possesses, a question remains to be answered - does a bullet falling under gravitational pull or one at the end of the parabolic trajectory have enough kinetic energy to cause injury or death? A bullet at the end of its parabolic trajectory is likely to possess more energy than that of a falling bullet.

The mechanism of injury has to be explained using external ballistics and aerophysics. The M41 LAAG (Light Anti-Aircraft Gun) is the main weapon that has been used in this instance. It is a triple-barrelled, electric-powered, link less, belt-fed weapon. It fires 450 to 550 12.7x99 mm armour penetrating rounds per minute⁶.

The muzzle velocity could be up to 1488 - 2232 meters per second⁷. Therefore, if the target is hit

before the end of the trajectory there is a high possibility of the velocity of the bullet being above the velocity which is needed to penetrate the skin.

Literature revealed that the terminal velocity of a falling bullet fired with a standard rifle weapon is between 60 – 100 m/s (200 - 330 ft/s)⁸. Therefore, a bullet travelling in a parabolic trajectory, would possess more energy than that of a falling bullet.⁸ A velocity of between 45.1 and 60.0 m/s (148 and 197 feet/s) is required for a bullet to penetrate the skin, which is easily reached by a falling bullet⁵. Vertical shooting is considered to be less lethal than angulated shooting⁸. The larger the caliber of the falling bullet, the higher the terminal velocity as compared to smaller caliber bullets⁸. A 12.7mm bullet is a reasonably large bullet with an average weight between 50 -60 grams, which makes it potentially lethal even when falling under gravitational pull.

The morbidity and mortality depend on where in the body the bullet strikes. The site of the injuries caused by falling bullets varies with the posture of the victim at the time of trauma. Usually, in the case of falling bullets, they tend to hit on the upper parts of the body when the victim is in erect or seated posture.

A report made by the Center for Disease Control (CDC) in the United States of America states that the commonest site to receive injuries is the head⁹. A study carried out by Al-Tarshihy reveals that the commonest areas to sustain injuries have been identified as the chest and lower extremities¹⁰.

The CDC in the United States of America has also reported that 80% of these stray bullet injuries are to the head, followed by feet and shoulders.

This is a unique case of accidental death following an anti-aircraft fire. In this instance, a young girl succumbed to injuries sustained due to an anti-aircraft bullet. This is an unfortunate rare event. It also emphasizes the lethal effect of a high-speed bullet, causing the death of a person at a distance from the offending gun. However discussion and analysis of certain facts e.g. determining exact direction and trajectory of the bullet was limited as the exact location of the gun could not be obtained due to security concerns.

CONCLUSIONS

This case highlights the importance of performing medico-legal investigations and autopsies with an open mind as in the initial stages in the investigation did not suggest firearm injury. It also highlights the possibility of occurrence of unexpected injuries and fatalities in aerial firing.

ETHICAL ISSUES

None

CONFLICTS OF INTEREST

There are no conflicts of interest.

AUTHOR CONTRIBUTIONS

NDNAM: Total work done by the author.

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