

## Death due to tandem bullets with single entry wounds: Case report

Tek giriş deliği olan iki ardışık mermiye bağlı ölüm: Vaka sunumu

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### ABSTRACT

In autopsies of firearm-related deaths, besides determining the cause of death, it is necessary to determine the shooting distance, entry and exit wounds, the bullet remaining in the body, and the trajectory of the bullets. In a case with a single gunshot bullet entry wound, it is unusual to have multiple bullets or multiple exit wounds in the body. The so-called tandem bullets occur when two or more bullets are fired from the barrel of the firearm with a single pull of the trigger. This situation can be caused by an insufficient amount of gunpowder, low quality of gunpowder, and different technical problems with the firearm. In our study, we presented a case of suicide from a contact shooting with a single entry wound from the right temporal region two bullets, and a cartridge case in the head. We aimed to contribute to the literature by presenting a rare case of a tandem bullet with a single-entry wound.

**Keywords:** *Firearm, tandem bullets, entry wound, contact wounds*

### ÖZET

Ateşli silaha bağlı ölümlerin otopsilerinde ölüm nedeninin tespiti yanında, atış mesafesinin, giriş-çıkış yaralarının, vücutta kalan mermi çekirdeğinin ve merminin trasesinin belirlenmesi gerekir. Ateşli silah yaralanmalarında vücutta kalan mermi çekirdeği de düşünülerek, giriş-çıkış lezyonlarının birbiri ile uyumlu olması beklenir. Tek ateşli silah mermi çekirdeği giriş yarası olan bir vakada vücutta birden fazla mermi çekirdeği olması veya birden fazla çıkış yarası olması sıra dışı bir durumdur. Ardışık mermi (tandem bullets) olarak isimlendirilen durum, tetiğin tek bir çekişinde ateşli silahın namlusundan iki veya daha fazla merminin atılmasıyla meydana gelir. Bu duruma barut miktarının yetersiz olması, barut kalitesinin düşük olması ve ateşli silahla ilgili farklı teknik sorunlar sebep olabilir. Çalışmamızda sağ temporal bölgeden tek giriş olan kafa içinde iki mermi çekirdeği ve bir kovan bulunan bitişik atış mesafesinden bir intihar olgusunu sunduk. Nadir görülen tek giriş yarası olan ardışık mermi olgusunu sunarak literatüre katkı sağlamayı amaçladık.

**Anahtar Kelimeler:** *ateşli silah, ardışık mermi, giriş yarası, bitişik atış*

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## INTRODUCTION

In postmortem investigations of firearm-related deaths, the focus extends beyond determining the cause of death. Factors such as the shooting range, differentiation between entry and exit wounds caused by gunshot bullets, and the presence or absence of retained bullets within the body are also scrutinized (1). At the crime scene, the connection between the victim, perpetrator, and the crime scene is established. Evidence is identified and collected, and an assessment of the bullets found is conducted to further clarify the incident (2). In cases where entry-exit wounds in firearm injuries are incongruent, it is crucial to consider the possibility that the assessment of entry and exit wounds may have been inaccurate (3). Additionally, it is essential to take into account less common scenarios, such as the fragmentation of the bullet upon entering the body, a single bullet causing multiple entry-exit wounds, or multiple bullets from separate shots passing through the same entry wound (4-6). We discuss a rare occurrence known as tandem bullet passage, where a single-entry single-exit wound is created through contact shooting with a firearm. This study presents a case of suicide death involving tandem bullets, contributing to the literature with a unique instance of a singular entry wound, which is uncommon in such cases.

## CASE

The subject of this case study is a 25-year-old male, identified as a single individual and employed as a security guard. In his medical history, he had recently initiated treatment for major depression and had made multiple suicide attempts by jumping from a height, resulting in minor trauma. After no contact for the past three days, law enforcement officers found him dead in a forested area alongside a roadside outside the city during a search. During the crime scene investigation, the deceased was found lying facedown in his daily attire, with his firearm located adjacent to the body. No additional criminal elements were identified at the scene. The body was subsequently transported to our forensic medicine institute, and the autopsy was conducted on the same day.

Shooting residues were detected in swap samples taken from the right hand. Radiological examination

of the entire body prior to autopsy revealed two metallic objects and the appearance of a cartridge case in the left parietal region. Additionally, a linear fracture was identified in the right temporal and sphenoid bone.

In the external examination of the body, it was noted that rigor mortis in the jaw had subsided. Postmortem hypostasis was fixed in accordance with the position of the corpse at the crime scene. A blue-green color change indicative of decomposition began to manifest in the lower right region of the abdomen. The examination revealed a star-shaped gunshot entry wound stained with soot in the right temporal region, located one centimeter above the ear. Additionally, a cavity with soot deposition and gunpowder was observed under the skin around this wound (Figure 1). While no exit wound was observed on the skin in the left parietal region, a discernible level difference compared to the surrounding area and subcutaneous stiffness were noted upon palpation.

During the autopsy, observations included craters on the inner surface of the skull in the right temporal bone and the outer surface of the skull in the left parietal bone. Bleeding and ecchymosis in the subcutaneous tissues around the wounds, particularly more intense in the right temporal region, were noted. Extensive brain tissue damage and bleeding were evident due to the penetration of a bullet. A 7.65 mm bullet with a deformed lower part was discovered in the bone tissue under the skin in the left parietal region.



Figure 1.



Figure 2.

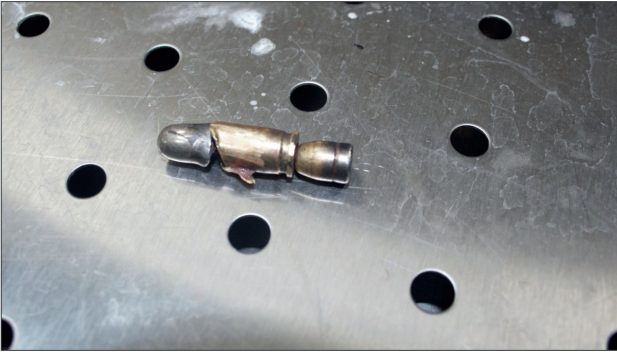


Figure 3.

Additionally, one 7.65 mm bullet and one cartridge case were found in the subdural area near this bullet (Figure 2). No traumatic pathological findings were identified in other body parts.

In the toxicological examination, there was no presence of alcohol, narcotics, or toxic substances in the blood and urine. Based on these findings, it was determined that two tandem bullets entered from the right temporal region. One of the bullets exited the left parietal bone and remained under the skin, while the other bullet remained in the subdural space in the same region. The cartridge case was found in the brain tissue in the left parietal region.

A ballistic examination of the gun was not conducted as it was not requested by the court. Nevertheless, during the autopsy, observations revealed deformation in both the upper and lower parts of the cartridge case extracted from the brain tissue. The deformed area on the upper part was found to be physically compatible with the base of

the first bullet. Additionally, traces on the surface of the second bullet were observed to be physically compatible with the traces found in the lower part of the cartridge case. Notably, it was observed that the gunpowder in the cartridge case was not fully burned (Figure 3).

Upon examination, both bullets were determined to be 7.65 mm and exhibited similar groove marks in microscopic analysis. The findings indicated that the case had succumbed to a tandem bullet passage resulting from a single shot originating from the right temporal region, indicative of contact shooting. Following an investigation by the prosecutor's office, it was concluded that the death was a result of suicide by firearm.

## DISCUSSION

Tandem bullet firing, as defined by the simultaneous discharge of two or more bullets from a firearm (7), occurs when the first bullet delivered to the muzzle of the barrel fails to eject, leading to the separation of two or more bullets in subsequent shots. The entrapment of the bullet in the barrel is attributed to factors such as the low flammability of the gunpowder or propellant, inadequate use of gunpowder in terms of quantity and quality, the utilization of homemade firearms, or technical malfunctions in the firearm (2,8).

Depending on the firing distance, tandem bullets may result in one or more entry wounds, influencing the forensic analysis of gunshot injuries (8). In our case, a single entry wound at contact range resulted in the entry of two bullets and a cartridge case into the cranium. The first fired bullet, following a distinct trajectory, passed through the bone tissue and remained under the skin. In contrast, the second bullet and cartridge case were retained in the intracranial region. While the occurrence of bullets from separate shots impacting the same entry wound, suggesting a tandem bullet, is rare, the absence of physical compatibility on the bullets differentiates them, indicating separate trajectories (6).

Forensic medicine specialists play a crucial role in elucidating incidents by meticulously examining all

entry-exit wounds and bullet trajectories in firearm injuries (7). The identification of tandem bullets can be intricate and not always straightforward. In the case presented, the presence of both bullets and a cartridge case within the head, following the same trajectory, facilitated a more straightforward diagnosis of a tandem bullet occurrence. However, in scenarios where two bullets exit together from a single wound or when one exits while the other remains within the body, assessing tandem bullets can be challenging. Difficulty may also arise when entry-exit wounds are indistinct, an unrelated skin lesion is misinterpreted as a gunshot wound or a single bullet causes multiple wounds (3,9,10).

In cases where autopsy findings provide insufficient assistance in diagnosing tandem bullets, a determination can be made by assessing the compatibility of physical damages observed in the bullet and cartridge case through forensic examination (11,12). Additionally, challenges in bullet detection may arise beyond entry and exit wounds. Reasons such as incomplete imaging of the entire body in pre-autopsy radiological examinations, the hindrance of detection by radiopaque objects (e.g., prosthetics, fillings), or the potential misinterpretation of different opaque materials as bullets can pose problems (7,13). Therefore, it may be beneficial to inquire about the medical treatments of the case in detail before radiological examination and to conduct the examination without clothing.

In conclusion, this study presented a rare case of tandem bullet death characterized by the presence of a single-entry wound—an uncommon occurrence. The diagnosis of tandem bullets was established through the observation of consistent physical damage in both bullets and the cartridge case, the presence of unburned gunpowder, and the determination that the bullets originated from the same firearm. In atypical scenarios where entry-exit wounds and bullet counts are incongruent, forensic medicine specialists should be vigilant about the potential for tandem bullets.

The accurate diagnosis of tandem bullets necessitates a meticulous evaluation of crime scene examination, pre-autopsy radiological assessments, and autopsy findings as an integrated whole.

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