



Case #105

NAME Educational Activities Committee

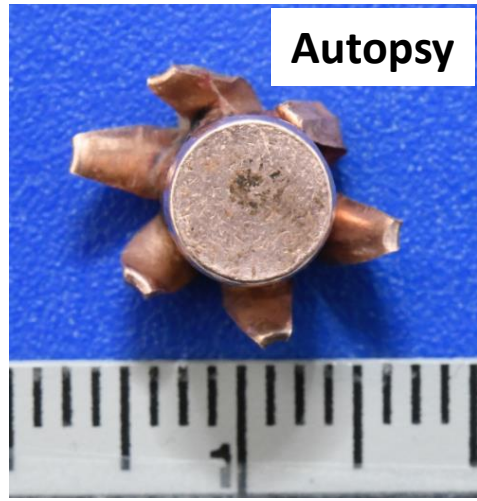
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Hospital

1. A young adult male was shot multiple times. He was brought to the hospital, where an emergency thoracotomy was performed and two partially deformed bullets were recovered. Despite resuscitative efforts, he died. At autopsy, two gunshot wounds to the chest were identified (see photos), and a third retained intact but deformed bullet was recovered from the right chest cavity.

What is the likely cause of the observed findings?

- Jacket-core separation
- Ricochet bullet
- Tandem bullets
- Hidden gunshot wound
- 'Old' retained bullet

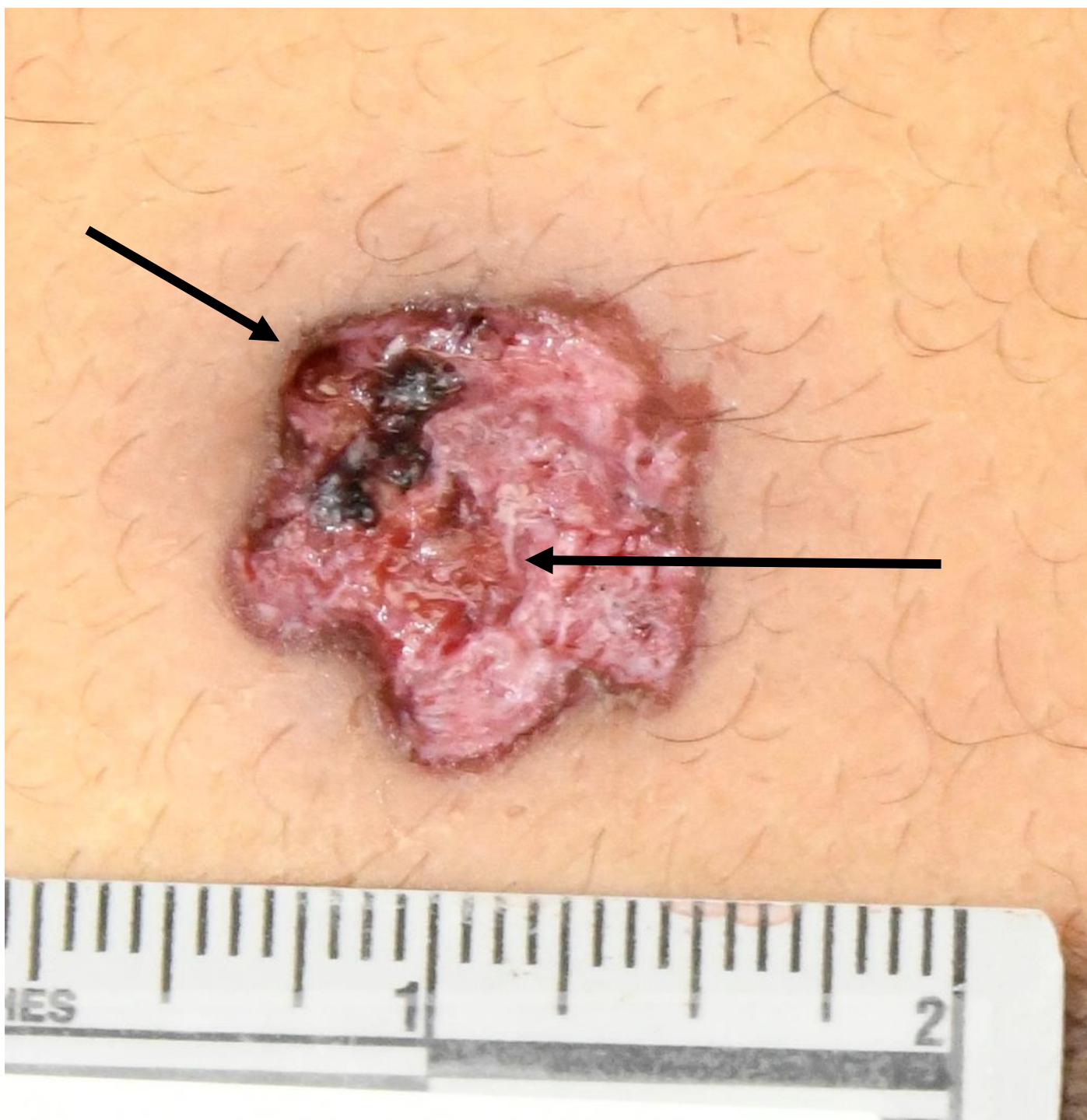
Answer...

C. Tandem bullets (CORRECT ANSWER, 29.60 % of responses)

This is an example of the rare tandem bullet phenomenon. A tandem bullet injury occurs when two or more bullets are expelled from a firearm barrel in a single pull of the trigger, or when the firearm is fired so rapidly that the second bullet follows closely behind the first through the barrel. This causes both bullets to enter the target together through a single entrance gunshot wound. This phenomenon can be due to insufficient quantity of propellant in the cartridge case or incomplete combustion of the propellant or if wrong ammunition is used. A weapon malfunctioning can also occur.

When two bullets travel in tandem, they can create a single entrance wound and potentially inflict more extensive internal damage due to the presence of multiple projectiles. Tandem bullets should be considered in cases where the number of observed wounds does not match the number of recovered bullets and fragments (e.g., one entrance wound with two retained bullets, or one entrance wound with two exit wounds). In rare instances, the tandem bullets may fuse together when the latter bullet penetrates the former, resulting in a single irregular fused tandem bullet upon recovery.

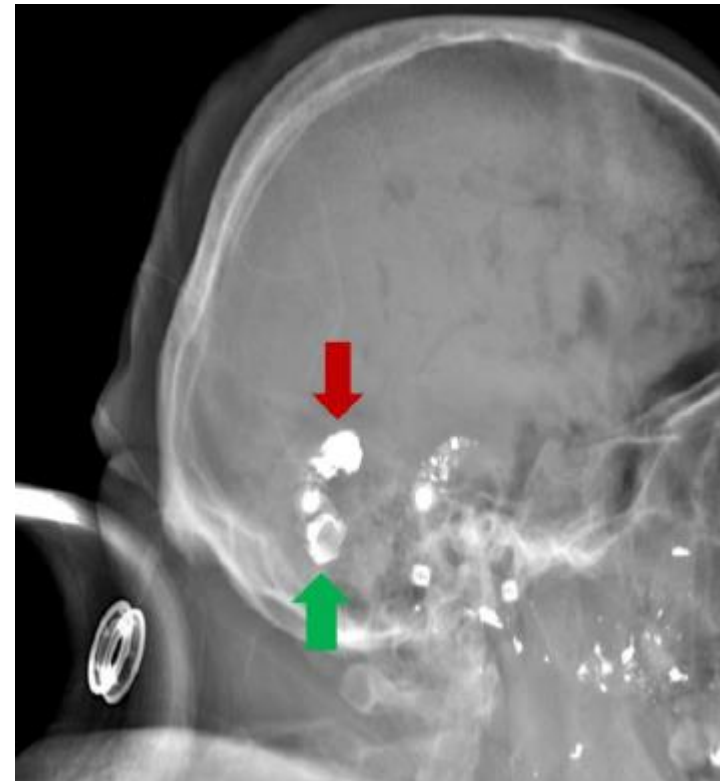
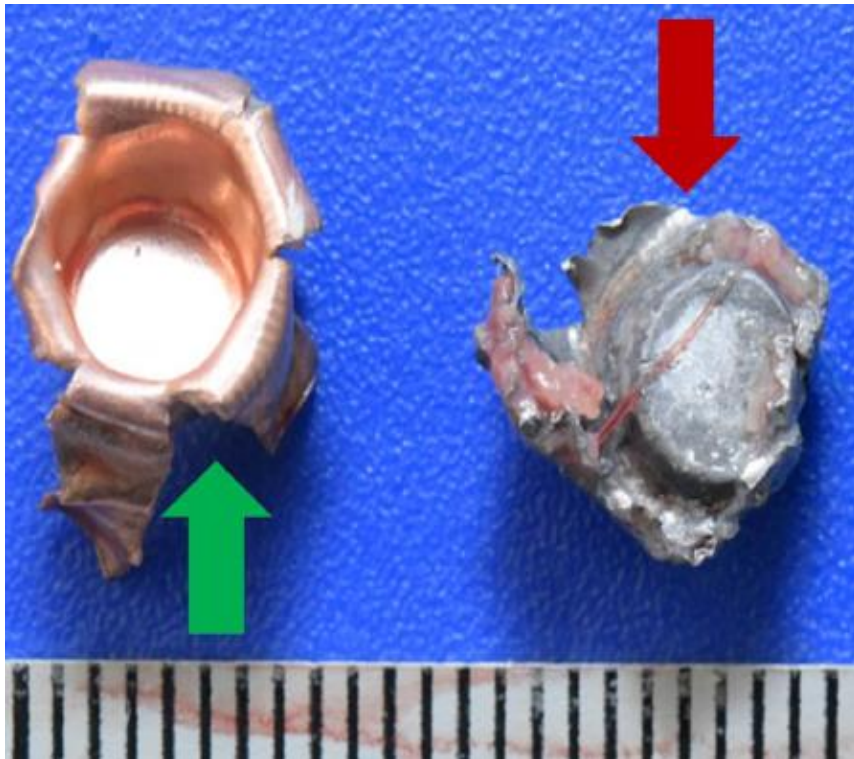
In the reported case, two distinct bullet paths were identified originating from the center of a larger, irregular, single wound, confirming that two bullets entered the body through a single entrance gunshot wound. The shape of the larger entrance wound suggests that one or both of the tandem bullets underwent deformation before penetrating the body. A third projectile was retained from a second, more typical entrance gunshot wound.



Two distinct wound paths originating from the same wound

A. Jacket – Core separation (30.93 % of responses)

Jacket-core separation occurs when the outer jacket of a bullet separates from the core, typically after impacting a target. This separation can leave distinctive marks or evidence on the target or within a wound, which forensic pathologists and investigators analyze to reconstruct events. This phenomenon can disrupt accurate quantification of gunshot wounds, especially when assessing them prior to autopsy (e.g., determining single or double entrance wounds with radiopaque bullets in radiography). In X-rays, the jacket component is generally more translucent compared to the core.



B. Ricochet bullet (12.71 % of responses)

'Bullet ricochet' refers to a projectile that deflects off a surface after initial impact rather than penetrating directly into it. When a bullet strikes a hard object such as metal, concrete, or even the ground, it can bounce off at an angle due to the projectile's high velocity and the hardness of the surface. Entrance wounds caused by ricocheting bullets often exhibit unusual characteristics. Unlike typical gunshot wounds, ricocheting bullets tend to penetrate rather than perforate tissue due to the projectile's deformation upon impact, resulting in reduced velocity and energy transfer. The impact can scatter minute fragments into the superficial soft tissues, complicating wound analysis and reconstruction. Partial-metal-jacketed bullets are particularly prone to fragmentation when hitting hard objects compared to lead- or full-metal-jacketed bullets.



D. Hidden gunshot wound (8.16 % of responses)

A hidden gunshot wound denotes an injury caused by a gunshot that is not immediately apparent upon initial external examination of the body. Such wounds can be effectively concealed by clothing, hair, or may be situated in anatomical regions that are typically obscured from view, such as the scalp, underneath the arms, in the genital area, on the buttocks, or in areas with multiple skin creases. In cases where the observed number of wounds does not correspond to the number of bullets reportedly fired, a comprehensive and meticulous inspection of the entire body surface becomes imperative. Furthermore, the presence of internal injuries without corresponding external wounds can suggest the presence of a concealed gunshot wound in that particular region.

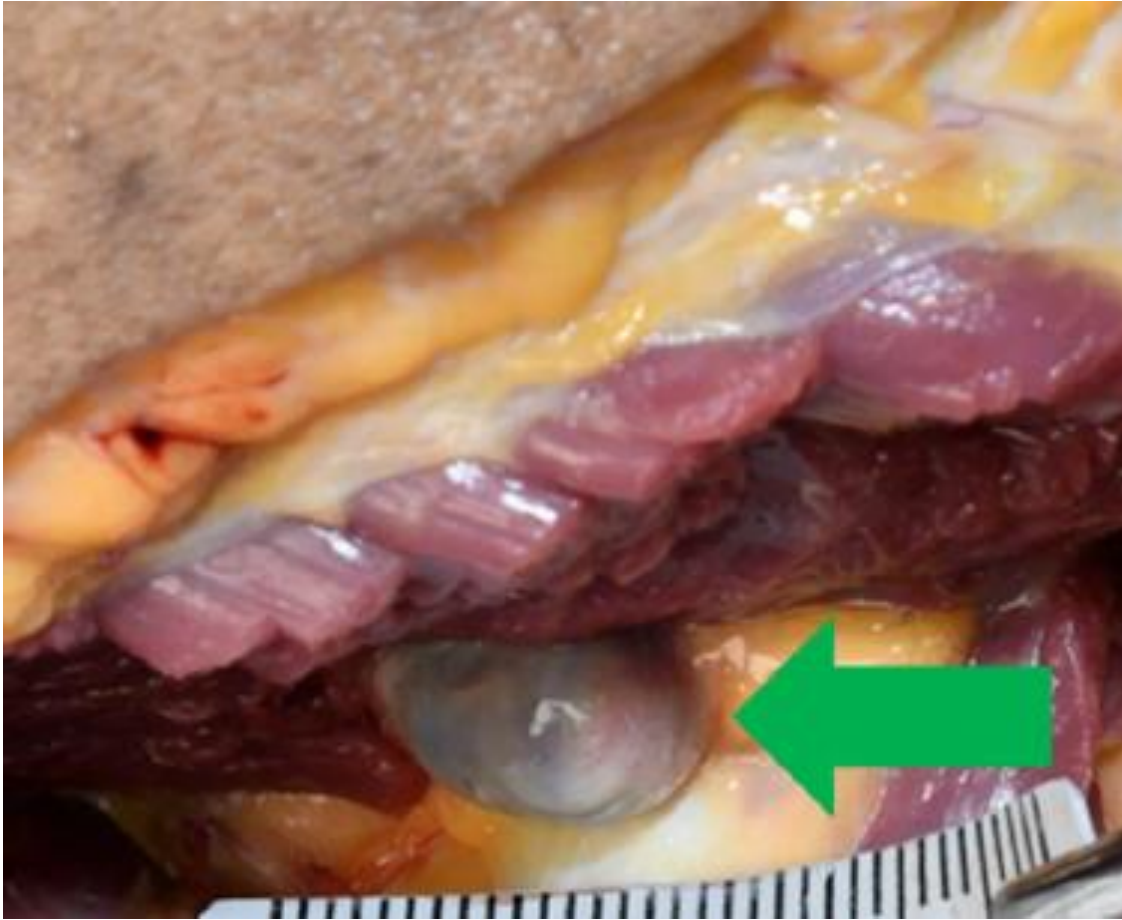
E. 'Old' retained bullet (18.60 % of responses)

These bullets, sometimes colloquially referred to as 'Souvenir bullets', are projectiles embedded in the body that often carry significant forensic implications. They can remain lodged in tissue for decades, can sometimes reveal a small old scar, hinting at their initial entrance wound. Generally, they are surrounded by a thick fibrous capsule. Once cleaned, the bullet surface may show a rust, rough appearance.

These bullets can still be linked to the cause of death, either through local complications such as nerve or vessel damage over time or through distant complications like embolization. Additionally, they pose risks of infections leading to sepsis or even lead poisoning if they remain within a joint cavity, where synovial fluid can dissolve their casing, potentially causing local damage or systemic toxicity.

Moreover, they might consist of ammunition that has become rare or discontinued over time, further complicating their identification and removal.

Even when not directly linked to the immediate cause of death, these bullets hold evidentiary value and may provide crucial insights into past criminal activities or incidents. Therefore, their recovery during autopsy is mandatory.



'Old' retained bullet

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