



# Case #109

NAME Educational Activities Committee

## Case provided by:

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1. A 57-year-old male was involved in a verbal altercation with his wife. He was later found in the backyard of his residence with a submental wound and a firearm over his chest.

This wound pattern is most likely associated with which of the following?

- Wad strike
- Muzzle brake
- Flash suppressor
- Livestock stunner
- Interposed target

Answer...

## C. Flash suppressor (CORRECT ANSWER, 63.15% of responses)

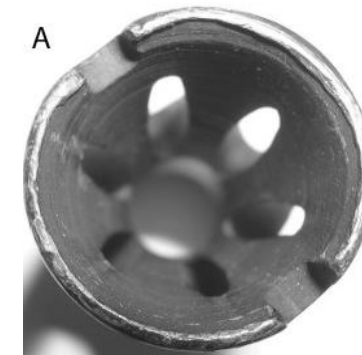
Also known as a flash guard, flash eliminator, flash hider, or a flash cone. These devices attach to the muzzle of rifles and are intended to reduce (or in some cases eliminate) the visible flash when fired at night.

When used properly, the benefits of a flash suppressor are two-fold:

1. To preserve the shooter's night vision.
2. To reduce flash visible to the enemy and avoid counterfire.

Flash suppressors are composed of a cylinder with several longitudinal slits along its length. Gases escape and are rapidly cooled/dispersed through these slits. This results in a decrease in density and temperature of the gases, reducing the visible flash. The overall amount of gas expelled, however, does not change.

In contact or near-contact shots with rifles fitted with flash suppressors, a "flower-like" pattern of abrasion/soot will surround the entrance wound or overlying clothing due to the initial hot gases escaping. The number of "petals" correlates to the number of slits, giving an idea of the type of weapon used (e.g., an AR-15 has six slits). The first photo on the right shows the weapon recovered from the scene in our case.



Gurcan A. An unusual characteristic "flower-like" pattern: flash suppressor burns. *Hippokratia*. 2012;16(2):189-190



Di Maio VJM. *Gunshot Wounds: Practical Aspects of Firearms, Ballistics, and Forensic Techniques*. Boca Raton. CRC Press. 1999.



Gurcan A. An unusual characteristic "flower-like" pattern: flash suppressor burns. *Hippokratia*. 2012;16(2):189-190

Other Answers...

### A. Wad strike (12.41% of responses)

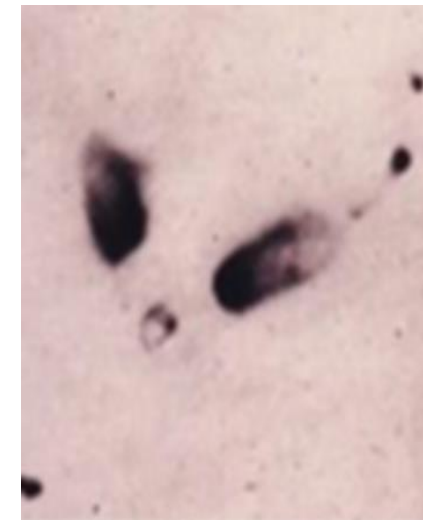
A wad or cup is a component of a shotgun shell that is used to separate and seal the shot from the gunpowder. In Federal and Remington ammunition, birdshot pellets are enclosed in cup with wadding containing several slits down its side. At close range, the individual arms or "petals" of the wad start peeling back and can strike the skin producing "petal" marks or a Maltese Cross abrasion, with three (.410 gauge) to four (12, 16, and 20 gauges) equally spaced, rectangular abrasions encircling the wound. Sometimes, not all petals will bend back evenly which may result in only one or two "petal" marks.



Di Maio VJM. Gunshot Wounds: Practical Aspects of Firearms, Ballistics, and Forensic Techniques. Boca Raton. CRC Press. 1999.

### B. Muzzle brake (17.22% of responses)

A muzzle brake is designed to reduce recoil by redirecting gases rearward, generating a forward motion on the muzzle instead. Just like sound suppressors, these can also be integral with a barrel or attach to the muzzle. Muzzle brakes are often interchangeable with compensators, which divert gas upwards to reduce recoil, as many muzzle brakes also function as compensators. Contact wounds with muzzle brakes/compensators produce an entrance wound with "rabbit-ear" soot deposits and possible skin searing/powder tattooing.



Quinton RA, Lenfest S. Contact Gunshot Wound Characteristics Associated with Muzzle Modification. Acad Forensic Pathol. 2015;5(2):369-373

Di Maio VJM. Gunshot Wounds: Practical Aspects of Firearms, Ballistics, and Forensic Techniques. Boca Raton. CRC Press. 1999.



#### D. Livestock stunner (5.56% of responses)

A livestock stunner, better known as a captive bolt gun/pistol/stunner, is used for the stunning of animals prior to slaughter. The device involves discharge of a blank cartridge to project a bolt into the forehead of an animal, rendering them unconscious. The bolt is then drawn back into the barrel, leaving no metallic projectile behind. Injuries to humans are rarely reported, with most being accidental. Contact wounds with captive bolt guns can produce an entrance wound with two to four symmetrically arranged, oval soot deposits if the gun is powder-activated and has frontal vent openings at the end of its muzzle. However, other types of captive bolt guns have lateral openings and either produce a soot deposit encircling the entrance wound or no soot deposit at all.

#### E. Interposed Target (1.67% of responses)

As a projectile passes through an interposing/intermediary object, there can be significant damage or fragmentation of the projectile and/or the interposed object itself. As a result, an entrance wound appearance can be significantly altered, often having irregular margins and eccentric abrasions. Soot may be entirely prevented from reaching the skin or have an uneven distribution. Additionally, fragments of the damaged object can strike the skin causing punctate abrasions and lacerations, known as pseudostippling. It is unlikely that the symmetrical wound pictured would come from an interposing object.



Nikolić S, Atanasijević T, Živković V. Unusual suicidal penetrating heart injury by captive-bolt gunshot. *Forensic Sci Med Pathol.* 2022;18(3):260-263.



Pircher R, Geisenberger D, Große Perdekamp M, et al. Suicide with two makes of captive-bolt guns (livestock stunners) fired simultaneously to the forehead. *Int J Legal Med.* 2017;131(6):1557-1564



Di Maio VJM. *Gunshot Wounds: Practical Aspects of Firearms, Ballistics, and Forensic Techniques.* Boca Raton. CRC Press. 1999.

# REFERENCES

1. Di Maio VJM. *Gunshot Wounds: Practical Aspects of Firearms, Ballistics, and Forensic Techniques*. Boca Raton. *CRC Press*. 1999.
2. Gurcan A. An unusual characteristic "flower-like" pattern: flash suppressor burns. *Hippokratia*. 2012;16(2):189-190.
3. Quinton RA, Lenfest S. Contact Gunshot Wound Characteristics Associated with Muzzle Modification. *Acad Forensic Pathol*. 2015;5(2):369-373.
4. Nikolić S, Atanasijević T, Živković V. Unusual suicidal penetrating heart injury by captive-bolt gunshot. *Forensic Sci Med Pathol*. 2022;18(3):260-263.
5. Pircher R, Geisenberger D, Große Perdekamp M, et al. Suicide with two makes of captive-bolt guns (livestock stunners) fired simultaneously to the forehead. *Int J Legal Med*. 2017;131(6):1557-1564.