# ATYPICAL FIRE INJURY CAUSED BY A PLASTIC PROJECTILE

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## Abstract

We present a case of a homicide of a man, found with a wound on his right anterior neck surface, with the general morphology resembling a stab-incised would. Inspection of the crime scene, as well as external and internal examination of the body of the deceased were performed in the Department of Forensic medicine and deontology, Medical University – Sofia. During the layer-by-layer tracking of the injury, a star-shaped rupture of the trachea was found - on its anterior and posterior surfaces, as well as damage to the left half of the esophagus at this level with a general morphology resembling the effect of a sharp object. On the anterior surface of the third cervical vertebra a rounded defect with a diameter of about 3-4 mm was found, which continued in depth through the entire thickness of the vertebral body. An additional incisions in the upper back part of the thorax and back of the neck was performed, with opening of the spinal canal, which revealed a complete rupture of the spinal cord and traces of "intrusion" of the left half of the bone structures forming the spinal canal at this level. The soft tissue around the third and fourth vertebrae were found with hemorrhage and stratification, continuing in the direction of the right back thorax surface and slightly downward. Following this hemorrhage and soft tissue stratification, a projectile was found in the area under the right scapula. Examination of the projectile revealed that it was a 9mm plastic GFL bullet.

***Key words**: atypical gunshot wound, imitation damage, plastic GFL projectile, GFL cartridge*

## Introduction

In the forensic practice there are very rare cases of damage from the action of special projectiles, respectively there is little knowledge of the morphology of injuries from such ammunitions, and their action from different distances [1]. In the Department of Forensic Medicine and Deontology, for the period 2000-2020, against the background of numerous cases of murders, suicides and accidents caused by firearms, in only one case (currently presented) was proven that the damage to the tissues was caused by a plastic projectile that caused atypical damage resembling a stab-incised wound to the skin. Such ammunition is designed primarily to combat terrorism, respectively, shooting in closed spaces (airplanes) [2], as these projectiles have a smaller mass and do not have a large penetrating force [2, 3]. They also, easily change their trajectory in contact with various anatomical structures, which leads to a kind of "increase" in the length of the wound canal, respectively faster "consumption" of available kinetic energy [3]. In such injuries, an exit wound can rarely be observed (mainly in contact shots) [4, 5]. These special ammunition were invented by Giulio Fiocchi, Lecco (Italy). Hence the abbreviation for this type of ammunition is GFL-bullets (photos №№ 1, 2, 3, 4). The exact composition of these projectiles is a trade secret.

Photo № 1

Photo № 2

Source (https://picturearchive.gunauction.com/238455/9356317/acf33e8.jpg; https://picturearchive.gunauction.com/238455/9356317/acf33e9.jpg)

Photo № 3

Photo № 4

**Case presentation:** We investigated a case of homicide of a man where on the crime scene, carried out in the dark part of the day (in low artificial light), the examination of the corpse revealed a wound on the right anterior lateral surface of the neck in its upper third with a common cleft shape and general morphology resembling a stab-incised wound, against the background of which, in the area of the corners of the wound were differentiated damages resembling "additional cuts", and next to it there were three abrasions in the form of scratches, whose morphology does not exclude tangential action of an object with a very limited contact surface (what are the characteristics of a knife tip). Due to this morphology of the injury, it was concluded that it was a murder with a sharp object (knife).

**Materials and methods**: A forensic examination of the case was performed, including an autopsy and a stereomicroscopic examination of the detected projectile.

**Results:** The morphological changes found during the initial examination of the crime scene were confirmed during the autopsy of the body (Photo № 5). But the further careful analysis of the wound revealed the presence of limited "smoking" (soot) and burning of the skin above the upper edge of the injury, as well as the presence of reddish hemorrhage of the soft tissues around it and a discrete rounded 'defect' located in the central part (photos № 6).

Photo № 5

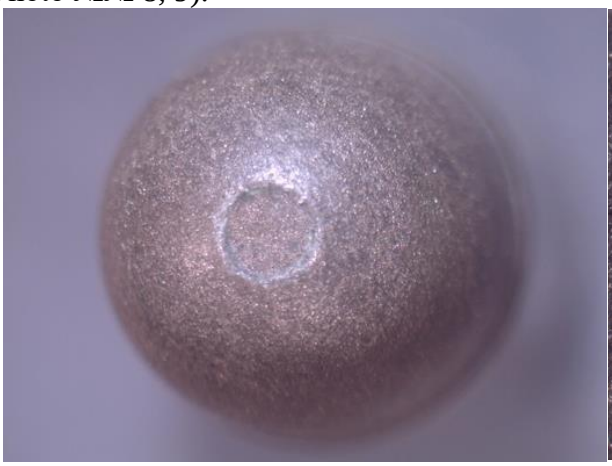
Additionally, layer-by-layer follow-up of the injury revealed star-shaped rupture of the trachea - on its anterior and posterior surfaces, as well as damage to the left half of the esophagus at this level with a general morphology resembling the action of a sharp object. On the anterior surface of the third cervical vertebra a round defect with a diameter of about 3-4 mm was found, which continues in depth through the entire thickness of the vertebral body. This finding necessitated a change in the sectional technique and proceeded to additional incisions in the upper back and back of the neck, as well as the opening of the spinal canal.

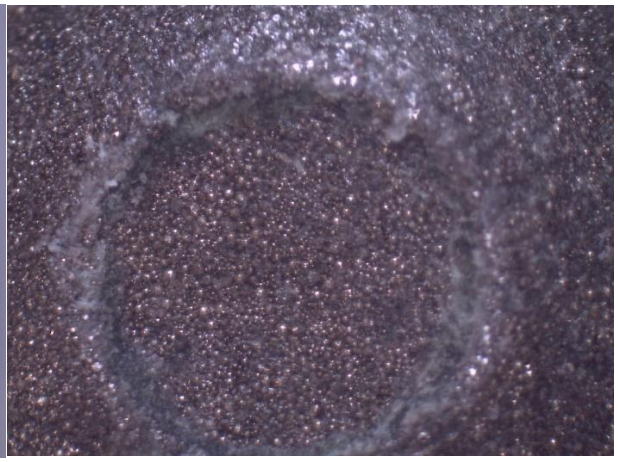
Photo № 6

This study revealed a complete rupture of the spinal cord in the area of the third-fourth cervical vertebrae, as well as traces of "intrusion" of the left half of the bone structures that make up the spinal canal at this level. In the right half of the spine, between the transversal procesi of the third and fourth vertebrae, hemorrhage and soft tissue stratification were found, continuing to the right, along the back and slightly downwards. When tracing this hemorrhage and the stratification of the soft tissues, a projectile was found in the area under the right scapula. Upon inspection of the projectile, it was found to be a 9mm plastic GFL (Photo № 7).

Photo № 7 – General morphology of the detected projectile

During the stereomicroscopic examination of the discovered projectile, the presence of many different-sized glued shiny particles resembling metal with a "copper" tint were observed (Photo №№ 8, 9).





Photos № 8 and 9 - General and detailed aspects of the “tip” of the bullet

**Discussion and conclusion**

Based on the overall morphological autopsy finding, as well as from the additional examinations of the discovered projectile, it was reasonably concluded that it was a gunshot wound with a special purpose ammunition, namely a plastic GFL projectile. Ignorance and lack of professional experience and experimental research on the morphology of injuries caused by this type of ammunition can lead to erroneous forensic conclusions, respectively, to the undesirable misrepresentation of the case to the investigating authorities, which in turn would lead to the non-disclosure of the affected weapon and the perpetrator of the crime.

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