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### H68 The Importance of Postmortem Computed Tomography in a Gunshot Wound-Related Death: A Case Report

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After attending this presentation, attendees will have a better understanding of the usefulness of Postmortem Computed Tomography (PMCT) in a gunshot wound-related death.

This presentation will impact the forensic science community by demonstrating the accuracy of PMCT in the depiction of the wound track, discerning between entrance and exit wounds, and showing the bone's fracture and the internal course of the bone fragments.

PMCT is especially useful in gunshot wound cases, allowing an easier location and retrieval of the bullet and/or its fragments inside the body that may help in identifying the ammunition and the weapon type utilized; however, PMCT permits a detailed preliminary 3D documentation of the ballistic effects, allowing one to obtain essential information such as: accurate depiction of the wound track; discerning between entrance and exit wounds; and, demonstrating a bone's fracture and its fragments' course inside the body. Of these, the study of the bullet course inside the body is of extreme importance for the reconstruction of the event and to understand the positions of perpetrator and victim, with special regard to homicide cases involving fatal gunshot wounds.

A case of gunshot wounds in which PMCT scans were performed is presented. The case concerns a 73-year-old White male found unresponsive in his truck. Multiple gunshot wounds were observed on his body, affecting the upper arms, the neck, and the head.

A preliminary PMCT scan was performed before the postmortem examination. The following features were described in the CT report on the soft tissues of oropharynx: just in front of C2 vertebral body, a foreign conical-shaped metallic body was present (2x1.3cm) referable to a bullet; on the mandibular body, a burst fracture and a dislocation of teeth were present; on the left mandibular branch, multiple fractures were present; on the right maxillary bone, a displaced fracture was present that led to a dislocation of the alveolar arch; on the atlas vertebra, a fracture of the right anterior arch and a fracture of the right lateral mass were present; a misalignment between the atlanto-epistropheal joint and the C3 vertebral body was present; and, at the external examination of the body, 18 gunshot wounds were observed. Despite the high number of gunshot wounds, only six bullets were fired, suggesting the presence of multiple re-entry wounds. At the postmortem examination, the wound paths were able to be clarified.

In this case, the PMCT found all the wound paths and their direction inside the body. In particular, five wound paths (of which 4 blind paths), were identified with multiple re-entry wounds. In all cases, the wound courses traveled left to right, front to back and upwards. This study found the PMCT extremely accurate in the localization of the bullet; however, due to the PMCT, the misalignment between the atlanto-epistropheal joint, difficult to visualize using the standard autopsy examination, was found.

According to these findings, the dynamics of the event were reconstructed. The subject was sitting in the cockpit of his truck, while the offender was standing at a distance of >50cm from the left door (driver's seat side). The offender started firing multiple times, aiming at the head of the victim. The victim tried to protect himself by performing a right-side rotation and putting his left arm, forearm, and hand to the face, like a shield. The suggested scenario justifies the large number of gunshot wound found on the body, despite only six shots being fired.

In conclusion, the reported case emphasizes the importance and the advantages of the PMCT in forensic science and ballistics. The multislice scans together with the 3D rendering allow easy localization of bullets and their fragments inside the body in order to identify and reconstruct the wound paths, with special regard to the injury to the soft tissues, the parenchymal organs, and the bones; however, this technique is of great help in the identification of injuries located in body regions which are difficult to locate by dissection, such as the posterior neck region, the soft tissues of the face, and the cranial bases. The biggest disadvantage of this technique is the inability to recover the bullet or its fragments from the body by use of this technique alone.

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#### Virtopsy, Gunshot Injuries, 3D Reconstruction