



Pathology/Biology Section - 2015

H50 In Ballistics, Interpretations of Postmortem Multi-Slice Computed Tomography Are Often Simple ... But Not Always

Dedouit Fabrice, MD, Hopital Rangueil, Service de Medecine Legale, 1av. J. Poulhes, TSA 50032, Toulouse Cedex 9 31059, FRANCE; Frederic Savall, Service de médecine légale, Hopital de Rangueil, 1 avenue Professeur Jean Poulhès, Toulouse Cedex 9 31059, FRANCE; Fatima-Zohra Mokrane, MD, 1 Avenue Professeur Jean Poulhès, 31059 Toulouse Cedex 9, Toulouse 31059, FRANCE; Marion Vergnault, Hôpital De Rangueil, 1 Avenue Du Professeur Jean Poulhès, Tsa 50032, Toulouse 31059, FRANCE; Hervé Rousseau, PhD, 1 Avenue Professeur Jean Poulhès, Toulouse 31059, FRANCE; Daniel Rouge, MD, Service de Medecine Legale, Centre Hospitalier Univ Rangueil, Avenue du Professeur Jean Poulhes, Toulouse Cedex 4 31403, FRANCE; and Norbert Telmon, PhD, MD, Service Medico-Judiciare, CHU Rangueil, 1 Avenue Jean Poulhes, Toulouse F-31054, FRANCE*

After attending this presentation, attendees will understand that even if the number of Postmortem Multi-Slice Computed Tomography (PMMSCT) explorations in ballistic contexts is high, some radiological aspects may be difficult in terms of interpretation. This presentation presents and discusses different surprising postmortem multi-slice computed tomography explorations which are didactical for radiologists and forensic pathologists. This presentation insists on the quality needed concerning the police inquiries and on the fact that postmortem multi-slice computed tomography explorations are a precious complementary exploration for the forensic pathologist, which cannot be interpreted without autopsy or external examination elements.

This presentation will impact the forensic science community by showing three different surprising PMMSCT explorations that are difficult in terms of interpretation for radiologists and forensic pathologists. Seeing the abnormal aspects is one step; giving medicolegal sense and interpretation to this aspect, with an integration of the radiological aspects in one coherent and intelligent forensic meaning, is another step. This second step, in some particular situations, may surely be the most complicated and most problematic.

PMMSCT is now worldwide developed. One of the most frequent indications of PMMSCT concerns gunshot trauma; however, even if the number of PMMSCT in ballistic contexts is high, some radiological aspects may be difficult in terms of interpretation. This presentation will discuss three different aspects of PMMSCT which are didactical for radiologists and forensic pathologists.

Case 1: The first case concerns an 88-year-old man found dead on the ground, close to the base of a crane in a construction area. Based on the police investigations, the main hypothesis was a suicide from a fall from height. The PMMSCT showed presence of multiple subcutaneous and intra-cranial metallic pellets in the left fronto-temporal area. The detection of a bone defect was difficult due to metallic artifacts; however, some radiological aspects, like the absence of a clear cutaneous defect and absence of peri-lesional hemorrhage, did not suggest acute or recent gunshot trauma. The medicolegal autopsy confirmed the different radiological aspects. Furthermore, a slight cutaneous scar was noted at the left fronto-temporal region. Consequently, the hypothesis of a previous suicide attempt was retained. The final cause of the death was a poly traumatism secondary to a fall from great height. This case illustrates an unexpected detection of stigmata of previous gunshot trauma in a context of a fall.

Case 2: The second case concerns a 77-year-old man found dead in a lake with an anterior abdominal gunshot cutaneous entrance wound. Based on the police investigations, the main hypothesis was a suicide by gunshot. The PMMSCT revealed the presence of multiple hyperdense foreign bodies of different sizes within the chest. This aspect was interpreted as intrathoracic metallic pellets associated with two bullets. The medicolegal autopsy revealed that the two bullets were metallic elements of a button of the jacket worn by the deceased and displaced within the body during the gunshot due to the button's interposition between the end of the rifle and the skin. The final cause of the death determined by the forensic pathologists was a suicidal abdominal gunshot. This case illustrates the importance of the external examination and the autopsy elements because in this case, it was very easy to misdiagnose metallic fragments of a button as bullets. The association of different types of oriented projectiles resulted in initially opining the manner of death to be homicide. Consequently, false positivity concerning this aspect may have important judiciary consequences.

Case 3: The third case concerns a 73-year-old man found dead at home. Based on the police investigations, the main hypothesis was a homicide secondary to a multiple blunt trauma using a hammer. The PMMSCT revealed the presence of multiple subcutaneous and hyperdense foreign bodies located at the right fronto-temporal area. This aspect was interpreted as metallic pellets. The police investigation at the deceased's home led to the discovery of an airgun with a box of numerous small metallic projectiles. The medicolegal autopsy confirmed those findings except for the description of one projectile in the left orbit. This case illustrates the unexpected detection of some metallic air-gun bullets in a context of blunt trauma with a hammer.



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These cases illustrate that sometimes interpretations of the postmortem explorations performed in ballistic trauma may be difficult, revealing some unexpected or atypical aspects. It also underlines that the interpretation of the PMMSCT necessitates collaboration between radiologists and forensic pathologists.

Postmortem Imaging, Gunshot, Pitfall