
E50 How to Get Away With Murder: The Importance of a Correct Reconstruction of a Crime Scene Investigation (CSI)

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Learning Overview: The goal of this presentation is to explain the importance of using a scientific method to solve investigative questions in unclear crime scenes.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by demonstrating that the accurate collection of scientific evidence represents the keystone for discovering a crime.

In many countries, a local physician is the first figure that acts at the discovery site of a corpse. In these cases, the external examination is the principal tool adopted to look for the cause of death. This approach can be imprecise, as only the autopsy can reveal the exact mechanism of death. Furthermore, a doctor who is not a forensic pathology expert tends not to pay attention to the state of the discovery site of the body. This can lead to incorrect conclusions on the modalities of death.

The presented case concerns a 50-year-old man found dead on his restaurant floor, near the rolling gate. Police site inspection revealed a ladder leaning against the wall under the rolling gate box. An electric cable hung from this ladder. The emergency responder said the cause of death was due to electrocution associated with fall trauma. Initially, the death was classified as an accidental event. Nevertheless, the prosecutor required the intervention of a team of forensic pathologists to perform the site inspection and the external exam of the corpse.

When the forensic pathologists arrived on the scene, they noticed that the cable was intact, with no knots, and was not connected to any electrical source. External examination of the corpse revealed the absence of electric marks on the skin and the presence of a ligature mark on the neck. According to the forensic pathologists, the ligature mark characteristics did not correspond to the electric cable found on the scene. No other traumatic lesions were found.

After the preliminary cadaveric inspection, the prosecutor opened a judicial file and required an autopsy. The autopsy showed hemorrhagic infarction areas of the muscles of the neck and the right parotid gland and a fracture of the right posterior horn of the hyoid bone. Histological examinations confirmed erythrocytes in the neck muscle samples; no wavy appearance or fragmentation of the myocardial fibers was found. Immunohistochemical examination performed on the skin sample of the ligature mark showed positivity to CD15, tryptase, and IL-15, demonstrating the vitality of the lesion. The positivity of human anti-hypoxia-induced factor 1- α (HIF1- α) on endothelial cells of the lung vessels confirmed the asphyctic death. Toxicological exams revealed positivity to high levels of alcohol and cannabinoids in the blood. In conclusion, the evidence derived from crime scene data (external examination, autopsy, histological, immunohistochemical and toxicological exams) contributed to excluding an accidental event and corroborated the hypothesis of homicide. The death was attributed to strangulation. Further inspection of the places surrounding the restaurant did not allow the scientific police to find other ligatures compatible with the mark on the neck. Investigations are still ongoing.

Strangulation, Crime Scene Investigation, Ligature Mark