The evaluation of the time since death and of the time since dismemberment. Indeed, exsanguinations and dismemberment of the body prevent an accurate evaluation of lividity and rigidity.

The identification of the tools used to cut the body. Careful, thorough investigation is a key point to ensure that potential physical evidence is not tainted or destroyed. In particular it is essential to identify any potential sharp cutting weapons at the crime scene. Moreover, when saws are used to cut the body, characteristic tool marks are left on the bone. The nature of the marks depends on the size, shape, width of the saw, and on the sawing action of the user.

Environmental Scanning Electron Microscopy (ESEM) may help in identifying the specific saw that has been used in the act of dismemberment. ESEM can detect and measure different types of striations, paint traces (such as rust inhibitor paints) or metal residues remaining on the bone after the cutting.

In the case presented, the determination of potassium levels in the vitreous humour and their time changes showed that the victim had been killed 20–25 hours before the death scene investigation.

The absence of lividities combined to histological and immunohistochemical investigation of the skin let investigators classify the dismembering injuries as non-vital wounds and to estimate the time interval between the death and the dismembering.

However, the most interesting finding was the identification of the tools used to cut the soft tissues and the bones of the victim. Morphological and morphometrical analysis of the skin lesions pointed out that the arms and the legs were cut with a sharp knife, whereas the head was removed from the trunk by a woodworker saw. ESEM analysis determined that the bone injuries were produced by a particular type of saw covered by rust-inhibitor paint.

Cutting Crime, ESEM, Dismembering

G15 Exploration of Non-Cardiogenic Pulmonary Edema With Chronic Opiate Use: Case Studies and Scientific Review

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After attending this presentation, attendees will learn how to characterize non-cardiogenic pulmonary edema during autopsy caused by opiate use. Additionally, attendees will learn about alternative opiate sources which may lead to cases of non-cardiogenic pulmonary edema. Such cases may present during autopsy and potentially lead to classification of a secondary cause of death or change in the classification of manner of death.

This presentation will impact the forensic community by providing potential answers to cases in which underlying chronic opiate use potentiates mortality. Chronic opiate use may synergistically lead to fatal pathology not readily recognized when secondary to diseased states in the lung. The presentation focuses on the reliability of diagnosing cause and manner of death during autopsy with the goal of increasing the validity of techniques, processes, and methods used in forensic medicine.

Use of opiate variants, including pain management medications such as morphine and street drugs such as heroin, have all been implicated in causing acute respiratory distress marked by non-cardiogenic pulmonary edema (NCPE). Despite efforts to treat patients who develop NCPE through chronic use or acute over-dose; presentation of NCPE stills has a mortality rate of 30–50%. With significant mortality and the rise in cases, development of NCPE is increasingly significant to the forensic community. The molecular and cellular mechanisms by which opiates induce non-cardiogenic pulmonary edema (NCPE) remain elusive. NCPE is a clinical hallmark of opiate use in long-term drug