A79 Dismemberment Injuries: The Contribution of Bone and Soft Tissue Histology

Tania Delabarde, PhD, Institut de Médecine légale, 11 rue Humann, STRASBOURG 67085, FRANCE; Catherine Cannet, 11 Rue Humann, Strasbourg 67065, FRANCE; Annie Geraut, MD, 11 Rue Humann, Strasbourg 67000, FRANCE; Marc Taccoen, MD, Institut Médico-Légal, 2 Place Mazas, Paris 75012, FRANCE; Bertrand P. Ludes, MD, PhD, Institut Medico- Legal, 2 Place Mazas, Paris 75012, FRANCE; and Jean-Sébastien Raul, 11 Rue Humann, Strasbourg, AE 67085, FRANCE*

After attending this presentation, attendees will better understand the potential of histological analyses on bone and soft tissues from dismembered victims.

This presentation will impact the forensic science community by providing three cases of documented dismemberment injuries that exemplify the contribution of histology to direct the investigation and bring evidence to the courtroom.

Dismemberment, the intentional separation of body segments, is known to be one of the major postmortem activities performed by humans on the remains of others. The victim's body is the foremost source of evidence and attempts to dispose of remains may inhibit identification and destroy links with the perpetrator, the crime scene, and the events leading up to death. Three forensic cases of dismembered victims are presented to discuss relevant autopsy and anthropological and histological findings.

Case Study 1: Dismembered body segments of a young adult male placed in three plastic bags were recovered in the street by a doorman next to a garbage area. During the autopsy, a great number of stab wounds were found and cause of death was determined as multiple stab wounds to the chest (cardiac and pulmonary laceration). The victim also sustained saw marks associated with complete separation at the level of the cervical spine, upper limbs, and lower limbs. Bone sections and cutaneous margins were removed for cut marks analysis and histology. Dismemberment was suspected to be postmortem as no evidence of hemorrhagic infiltration was observed during autopsy and was later confirmed by histopathology results. Numerous false starts and kerfs exhibited characteristics consistent with a power saw. Histomorphometric analyses of bone and soft tissue revealed the presence of exogenous particles (silicon carbide) that belong to a specific power saw blade. This information was crucial for the determination of the tool type used by the perpetrator.

Case Study 2: The remains of a saponified dismembered body from a young female were exhumed from a house basement. Only the lower limbs sustained dismemberment injuries with the complete separation of legs and feet. Bone segments were retained for both anthropological examination of cut marks and histological analysis. Kerf walls exhibited blue particles that were observed macroscopically and microscopically as potential paint residue. Anthropological and histological findings were relevant to identify class characteristics of the offending instrument: a hand saw with a blue-painted blade was finally recovered by police officers in the house of the perpetrator, who confessed to the murder and dismemberment of the victim.

Case Study 3: The saponified body of an adult male was exhumed from a shallow grave. The head was completely severed from the trunk at the level of the second and third cervical vertebra. Autopsy findings were consistent with sharp force injuries at the level of the neck with the use of a blade instrument. Bone and soft tissue were retained for examination of cut marks and histological analysis. Bone examination confirmed the presence of incisions on both vertebrae consistent with sharp force trauma. The presence of exogenous particles was determined on bone and soft tissue samples; their physical characterization was different from geological features from the grave location but consistent with the place of events described by perpetrators.

These three case studies illustrate that bone histology offers great potential for augmenting the investigation and is not limited to age estimation or bone remodeling. Soft tissue and bone samples from traumatic injuries should be microscopically examined as histomorphometric findings are complementary with forensic examination data and could sometimes provide key elements for the investigation.

Histology, Dismemberment, Forensic Anthropology

*Presenting Author