H85 Partially Skeletonized Remains Demonstrating Dragging Injuries, Internal Beveling of the Skull, and Tracheal Obstruction: A Team Approach

Brandy Shattuck, MD, Western Michigan Homer Stryker MD, School of Medicine, 1000 Oakland Drive, Kalamazoo, MI 49008; Carolyn V. Isaac, PhD, Western Michigan Homer Stryker MD, School of Medicine 1000 Oakland Drive, Kalamazoo, MI 49008; and S. Adam Shahid, PhD, Western Michigan Homer Stryker MD, School of Medicine, 1000 Oakland Drive, Kalamazoo, MI 49007*

After attending this presentation, attendees will recognize how a multidisciplinary team approach to partially skeletonized remains can help assist in determining timing of death and mechanism of trauma.

This presentation will impact the forensic science community by highlighting entomologic and anthropologic findings in partially skeletonized remains that may be found in medical-legal death investigations.

Skeletonized or partially skeletonized remains present challenges in forensic pathology. While identification of the remains has become easier with advances in fingerprinting, DNA, and comparative medical radiography, determining cause of death, manner of death, and approximate time of death can be difficult in this population. This study presents a case of partially skeletonized remains with distinctive bone damage on posterior surfaces and a cigar-like collection of leaves in the trachea.

Adjacent to a field, a partially skeletonized set of remains was discovered with multiple electric cords around the ankles and the neck. At the postmortem examination the next morning, the remains were found to have dry desiccation and mummification of the skin with skeletonization of the posterior aspect of the body, and a noticeable portion of the posterior cranial vault was missing. A forensic anthropologist was consulted to assess the skeleton. In addition to the skull, there were smooth, flat areas of bone disruption on multiple vertebrae, ribs, scapula, humerus, ulna, metacarpals, ilia, sacrum, femur, calcanei, and hand and foot phalanges. Such injury patterns are consistent with vehicular dragging as reported in the literature.[1-3] Furthermore, gross examination of the disrupted bones revealed evidence of gravel embedded in the bone margins. The margins of the residual skull were smooth and flat, with the exception of a single semi-circular defect that appeared to have inward beveling consistent with projectile trauma; however, the sharp, semi-circular defect did not have any associated skull fractures. The forensic anthropology team returned to the recovery site and subsequently recovered a section of skull that matched the area of inward beveling.

Further examination of the remains revealed a tightly rolled collection of green leaves in the trachea. A white larva was identified within the center of the leaf collection. An entomologist was consulted to identify the larva and to collect additional insects on the remains. The larva was determined to be a leafcutter bee (*Megachilidae*). The decedent was subsequently identified by fingerprint analysis. Law enforcement reported that the decedent was last known alive approximately three weeks prior to the discovery of his remains.

This unique case demonstrates the importance of having access to a multidisciplinary team when dealing with skeletonized remains in the forensic setting. The forensic pathologist was not familiar with leafcutter bees and their preference for nesting in open tubular structures, such as a trachea. One should carefully consider the circumstances and the possible mechanism of injury when assessing beveling in skeletonized remains that may have been dragged. While the pattern of inward beveling is closely associated with projectile trauma, it should be considered in cases of dragging. This team approach provided insight into the approximate timing of death and to the mechanism of skeletal injury, even if a discrete cause of death could not be determined.

Reference(s):

1. Prahlow Samuel P. and Joseph A. Prahlow. 2016. Fatal Dragging Deaths with Soft Tissue and Bone Grinding Injuries. *Academic Forensic Pathology*. 6 (4): 709-719. doi:10.23907/2017.067.

2. Fukushima, H., I. Yonemura, M. Ota, and H. Hasekura. 1990. A Case of Death Due to Dragging by a Car: Establishment of a Homicide Because of Conscious Negligence. *Japanese Journal of Legal Medicine*. 44 (2): 186-189.

3. Klintschar, M., M. Darok, and P. Roll. 2003. Fatal Truck-Bicycle Accident Involving Dragging for 45 Km. *International Journal of Legal Medicine*. 117 (4): 226-228. doi:10.1007/s00414-003-0364-9.

Skeletonized Remains, Leafcutter Bee, Drag Injury

Copyright 2018 by the AAFS. Permission to reprint, publish, or otherwise reproduce such material in any form other than photocopying must be obtained by the AAFS.

*Presenting Author