



## Pathology Biology Section – 2009

### G110 Postmortem Injury Detection in an Aviation Mishap: Computed Tomography Imaging Versus Autopsy

David M. DeLonga, PhD\*, Naval Medical Center Portsmouth, 6513 Harbour Pointe Drive, Suffolk, VA 23435; Angela D. Levy, MD, United States Army, Department of Radiology and Radiological Sciences, Uniform Services University of the Health Sciences, 4301 Jones Bridge Road, Bethesda, MD 20814; and Howard T. Harcke, MD, Department of Radiologic Pathology, Armed Forces Institute of Pathology, 3205 Coachman Road, Wilmington, DE 19803

After attending this presentation, attendees will understand the utility and limitations of postmortem computed tomography (CT) analysis of traumatic injury victims compared with standard autopsy.

This presentation will impact the forensic community by demonstrating how CT imaging can complement the conventional autopsy in the injury detection of aviation mishap victims.

**Purpose:** This study compared and contrasted the sensitivity of CT imaging versus autopsy in the postmortem detection of injuries sustained in an aviation mishap.

**Methods and Materials:** Four male victims from an aviation mishap were studied with whole-body CT examinations prior to conventional autopsy. Autopsies were conducted by forensic pathologists and autopsy reports created without reference to the CT imaging studies. Blinded to autopsy reports, two radiologists then retrospectively interpreted each study in a consensus fashion. Images were evaluated for fractures, dislocations, and soft tissue abnormalities resulting from traumatic injury. Radiology interpretation was compared to autopsy reports to determine the sensitivity of each method in detecting these injuries. CT studies were then re-examined to review missed or discordant findings in order to determine if a successful imaging correlate with the autopsy results could be obtained.

**Results:** Autopsy and CT imaging detected a total of 236 fractures and dislocations. Autopsy detected 139 (59%) and CT imaging detected 231 (98%) of these findings. In regions of the body that were not fully explored during the autopsy procedure (e.g., posterior vertebral body elements, scapula, and ribs), the CT images frequently revealed fractures not recorded on the autopsy reports. Autopsy and CT imaging detected a total of 56 soft tissue abnormalities. Autopsy detected 55 (98%) and CT imaging detected 14 (25%) of these findings. The detailed description of soft tissue abnormalities found in the autopsy reports was frequently not appreciated with CT imaging. Some of these soft tissue abnormalities were apparent in retrospect after being un-blinded to the autopsy reports.

**Conclusion:** The use of CT imaging is a useful adjunct to autopsy in the postmortem detection of injuries following an aviation mishap. CT imaging demonstrates high sensitivity for the detection of fractures and dislocations but is currently limited in the detection of soft tissue injuries.

*The views expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the Department of the Navy, Army, Department of Defense, or the United States Government.*

**Computed Tomography, Traumatic Injury, Aviation Mishap**