H11 Skeletal Trauma Patterns in a Vietnam-Era Aircraft Loss: Part I - Lower Extremities

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After attending this presentation, attendees will gain a broader understanding of the types of skeletal trauma exhibited in the lower extremities of multiple passengers of the same Vietnam era aircraft loss. In addition, based on consistencies in the patterns of fractures observed, a model is posited that delimits the types of lower extremity trauma expected in this type of aircraft loss.

This presentation will impact the forensic science community by serving as a baseline from which future investigators can compare and contrast skeletal trauma seen in casework. Specifically, knowledge of expected trauma patterns for certain aircraft mishaps and military loss incidents will enhance the interpretation of skeletal trauma throughout the field.

One feature that is often lacking from scientific literature reviewing trauma caused in aircraft losses, falls from heights, and automobile accidents, is specific detail regarding the types of fractures sustained. This lack of detail limits the interpretation and analysis forensic scientists can perform on such remains. The paucity of information on skeletal trauma may be related to an autopsy-based, or soft-tissue, perspective as well as a lack of sufficient case material covering more than a few individuals. This project seeks to fill this information gap by presenting a unique opportunity to describe the skeletal trauma exhibited across multiple individuals involved in the same aircraft loss incident. Specifically, this project, involves the analysis of lower extremity trauma (femur, tibia, and fibula) in a series of skeletal remains recovered from the 1965 loss of a C-123 cargo plane with 84 passengers on board. However, due to an incomplete recovery, nine years later in 1974, there are only approximately 30 individuals represented in the sample.

Review of the remains reveals a combination of peri-mortem fracturing and postmortem damage but an estimated 80% or more of the observed fractures are peri-mortemin origin. The nine-year lapse between the loss and recovery did result in some taphonomic damage; however, this did not significantly impede the observation of fracture surfaces and trauma patterns. For each element in the lower extremity, summary and descriptive statistics describing fracture types and orientations are presented for the proximal, middle, and distal thirds. When possible, specific information is given on fracture types in the femoral head and neck, knee, and ankle.

There is a consistency in fracture patterns across the sample, indicating a similar array of forces during the crash. Viewed as a group

assemblage, all individuals on the aircraft experienced dynamic, sudden deceleration, blunt force trauma during the crash resulting in nearly every bone in the lower extremity exhibiting one, if not multiple, fractures. Accepting some variability, a majority of the observed fractures are oblique in orientation, suggesting a predominance of bending (tension and compression) forces acting on the lower extremities.

Drawing this information together, a model describing the types of fractures is posited for this type of aircraft and loss incident. This model is presented to the greater scientific community as tool for comparison to other cases. A basic comparison of trauma patterns in other aircraft losses does indicate similarities, while differences are noted in cases with published data on falls from heights.

Trauma, Skeletal, Lower Extremity

 ** Presenting Author*