



Pathology/Biology Section - 2016

H80 Entrance or Exit? A Multidisciplinary Approach to Gunshot Wound Interpretation on Fresh Remains

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The goal of this presentation is to provide attendees with information on the advantages of using a multidisciplinary approach to the assessment of gunshot wound trauma on fresh remains at autopsy.

This presentation will impact the forensic science community by providing an example of how advantageous it is for forensic pathologists and anthropologists to work together when assessing gunshot wound trauma on fresh remains at autopsy. The use of both well-trained practitioners can indeed enhance the assessment of gunshot wound trauma and help to clearly identify entrance and exit wounds even when these wounds appear atypical in nature. This can be of particular importance when there are possible multiple shooters and also in corroborating witness accounts.

This case involves a child who was shot while inside a vehicle with a single perforating gunshot wound of the chest. Scene investigation revealed that gunshots were coming from nearly opposite directions and the child was caught in the crossfire, making the determination of direction of utmost importance. The bullet had passed through intermediary targets, causing atypical wound features. Evaluation of the direction of the shot was difficult based on evaluation of the skin because neither wound had clear characteristics of an entrance.

Given the unusual appearance of the entrance and exit wounds, an anthropological assessment of thorax was requested after autopsy. The anthropologist was blind to the circumstances of the case and was simply asked to assess entrance/exit trauma to help determine the direction of the shot. Trauma was identified on the right ribs seven through ten during the *in situ* analysis. The surrounding soft tissue was removed using a scalpel. Bony trauma was noted on right ribs nine and ten, with possible bony damage noted on right ribs seven and eight. Photographs were taken of the bony damage *in situ*. Right ribs seven through ten were then removed using a scalpel and retained for further analysis. The vertebral bodies of thoracic vertebrae seven through ten were removed during autopsy due to the presence of bony damage on the right side of the 9th and 10th thoracic vertebral bodies; therefore, these elements were also analyzed and retained for further analysis.

The retained ribs and vertebral bodies were macerated using warm water to assist in the removal of adherent soft tissue. After warm water maceration, the remaining soft tissue was removed from the ribs using a soft-bristled brush and forceps. The ribs were then allowed to air dry. In an effort to preserve the anatomical relationship of the vertebral bodies, the remaining adherent soft tissue on the vertebral bodies was not removed. Instead, the vertebral bodies were analyzed as a unit and placed into formalin after analysis.

The retained skeletal remains of the decedent exhibit peri-mortem trauma to right ribs 9 and 10, as well as thoracic vertebral bodies 9 and 10 that is consistent with ballistic trauma. The characteristics of the ballistic trauma to the ribs and vertebral bodies suggest that the force occurred in a posterior-to-anterior direction.

Simultaneously, further autopsy examination revealed other evidence consistent with a posterior-to-anterior direction. A small amount of dark textile material was identified in the soft tissue of the entrance wound and in the perforated right lung nearest the entrance wound.

Two disciplines, forensic pathology and forensic anthropology, working together with scene investigators came together as a team to form a reliable interpretation. The forensic pathologists, if working alone, would have otherwise had difficulty determining the direction of the shot and may have ultimately listed the direction as indeterminate. This case illustrates the importance of a multidisciplinary approach in some cases of gunshot wounds even on fresh remains.

Pathology/Biology, Anthropology, Gunshot Wound Interpretation