H34 Shark-Inflicted Trauma on Human Skeletal Remains

Maria T. Allaire, MA, Louisiana State University FACES Laboratory, Louisiana State University, 227 Howe-Russell Building, Baton Rouge, LA 70803; and Mary H. Manhein, MA, Department of Geography & Anthropology, Louisiana State University, Baton Rouge, LA 70803*

After attending this presentation, attendees will become familiar with shark-inflicted trauma on human skeletal remains. This type of trauma may be unfamiliar and/or not commonly seen by the forensic community.

This presentation will impact the forensic community by providing awareness and knowledge of a unique type of sharp trauma rarely encountered or observed by forensic anthropologists and other forensic scientists.

On August 16, 1997, the Jefferson Parish Coroner's Office was notified about the recovery of an unidentified male in a shrimper's trawl net in the Gulf of Mexico. At the time of recovery, the shrimp boat was 30 miles offshore at longitude 2829.9N and latitude 09026.3W. The U.S. Coast Guard retrieved the body from the shrimp boat and an autopsy was conducted at the Jefferson Parish Forensic Center on August 18, 1997.

According to the autopsy report, the body measured 5'11" in length and weighed approximately 83 pounds. The condition of the body was described as having "marked decompositional type changes present" with the head, right chest and back, left upper extremity, and both lower extremities being skeletonized. The right upper extremity was absent. "Irregular" gnaw-like marks were noted on the remaining tissue. Partially digested food was found in the stomach. The heart, lungs, liver, kidneys, spleen, esophagus, thyroid, pancreas, and adrenals were present. The brain was noted as being "generally liquid in nature." No definite signs of fractures, hemorrhage or other trauma, other than gnaw- like marks on the soft tissue, were identified. Based on the autopsy report, a postmortem interval of less than 48 hours from date of recovery was estimated.

On August 22, 2007, ten years after initial recovery, the unidentified remains, and associated clothing were picked up at the Jefferson Parish Forensic Center by the Louisiana State University Forensic Anthropology and Computer Enhancement Services (FACES) Laboratory personnel and transported to the FACES Laboratory at LSU for analysis and inclusion in a cold case database. Upon arrival at the FACES Laboratory, the partially skeletonized remains were processed and cleaned.

Results of the forensic anthropology analysis revealed that the male decedent's ancestry was more consistent with black; however, due to some white and Amerindian characteristics, a Hispanic ancestry is possible. The decedent was 5'8" – 6'2" tall and between 30 – 45 years of age at the time of his death. Antemortem fractures were present on the nasal bones, the left frontomalare suture and the left zygomatic arch. The presence of bone remodeling and smooth edges indicated that all three fracture sites were in the process of healing prior to death and that these fractures could have been the result of a single traumatic event for which the decedent may or may not have received medical treatment. The analysis also revealed that the decedent had an edentulous maxilla with pronounced bone resorption and remodeling, indicating that he had worn upper dentures for a long time. His mandible was toothless, except for the lower canine teeth, and vertical remodeling and thinning of the alveolar bone for all of the incisors were present. The decedent's lower canines, which were lost postmortem, had mechanically supported a partial lower denture by means of a "Dolder Bar" or similar oral reconstruction apparatus (Dr. Robert Barsley, Forensic Odontologist, personal communication).

Analysis of the postcranial elements revealed a remarkable and unusual series of individual incisions, overlapping striations, and punctures with or without associated fractures. The trauma was concentrated on the clavicles, right, and left ribs, on all three of the left arm bones, the left femoral head, the right hip bone, and along the entire shaft of the right femur. Based on the recovery location in the Gulf of Mexico, these types of trauma were probably caused by a combination of marine scavengers and predators. In fact, the overall pattern of the individual incisions, overlapping striations, and punctures, with or without associated fractures, are common bite mark artifacts produced by sharks (Dr. George Burgess, Director, Florida Program for Shark Research and International Shark Attack File, personal communication).

When a shark attacks, either as a scavenger or predator, water is displaced and pushed out in front of the shark like a wave. This shark- induced wave will cause the potential prey's body to move in the same direction as that wave. Just prior to their bite, sharks will close their eyes and rely solely on electromagnetic field sensing, which is not as accurate as sight orientation. The accuracy of the shark's bite is dependent on several variables. One variable is the water's natural wave motion. Another variable is the shark-induced wave, which is based on the size of the shark and its speed and direction of attack. A third variable is any movement(s) of the potential prey by its own volition or by either of the wave motions. Finally, the number of sharks and other marine life present will also affect the accuracy of a shark's bite. In deep water, the three most common shark species to attack humans are the White shark, the Tiger shark and the Bull shark. Bite trauma on the victim suggests at least one large, adult Bull shark and several other smaller species of sharks were involved (Dr. George Burgess, Director, Florida Program for Shark Research and International Shark Attack File, personal communication).

To assist with the identification of this individual, a clay facial reconstruction was completed. To

 ** Presenting Author*

illustrate both black and Hispanic ancestry, the clay facial reconstruction was then computer enhanced. The boots being worn by this male could also assist in his identification by way of a possible occupation. He was wearing steel-toed Tingley brand "Over-The-Sock Snugleg" boots. The manufacturer recommends this type of boot for the following applications: food processing, dairy, chemical, and petrochemical (exploration and production).

In the past, cases such as this had little opportunity for identification. With the current interest in creating and updating cold case databases across the country, the potential for positive identification of this victim is greatly enhanced. Finally, this presentation will provide forensic scientists with a better understanding of shark-inflicted trauma on human skeletal remains where case histories are sometimes unknown.

Shark-Inflicted Trauma, Shark Attack, Human Skeletal Remains

 ** Presenting Author*