



A32 Skeletal Indicators of Shark Feeding on Human Remains: A Case Study From the Eastern Coast of Florida

Michala K.S. Schaye*, 1376 Mowry Road, Rm G-17, Gainesville, FL 32610; Allysha P. Winburn, MA, C.A. Pound Identification Lab, Cancer/Genetics Research Center, 2033 Mowry Road, Gainesville, FL 32610; and George H. Burgess, MS, Florida Museum of Natural History, University of Florida, Gainesville, FL 32610

After attending this presentation, attendees will gain an understanding of skeletal trauma/damage patterns that likely indicate shark predation and/or scavenging through the examination of a case study originating from the C.A. Pound Human Identification Laboratory (CAPHIL) at the University of Florida (UF).

This presentation will impact the forensic science community by contributing to current forensic anthropological research regarding trauma and taphonomic analyses from skeletal elements deposited in a maritime environment — in particular, remains that were subjected to shark predation and/or scavenging. Furthermore, the benefit and utility of collaborating with experts in shark biology and cases of shark attacks will be discussed.

Shark predation and scavenging are becoming increasingly prevalent, especially along the United States' coastlines. Extended postmortem intervals and taphonomic damage from factors such as sand sediment and wave action in the marine depositional environment may obscure potential indicators of trauma and/or postmortem damage from shark feeding activities. A case study from the CAPHIL is presented in which three disparate human skeletal elements (left and right ossa coxae and a right proximal femur) washed ashore within several miles of each other on Florida's eastern coastline. Forensic anthropologists at the CAPHIL putatively reassociated these elements based on pair matching, articulation, and similar biological profile indicators (i.e., age and sex), in addition to the elements' similar taphonomic signatures indicative of deposition in a maritime environment (e.g., sandy adhesions, small barnacles, and erosion characteristic of wave action).

All three elements evidenced a distinctive pattern of trauma or damage, including sharp force defects and torsional loading. Anteroposterior loading on both ossa coxae resulted in bone failure around the acetabula, while a spiral fracture completely transected the right femur, of which only the proximal portion was recovered. During a collaborative analysis process with personnel from the Florida Program for Shark Research at UF's Florida Museum of Natural History (FLMNH), CAPHIL and FLMNH analysts determined that the pattern of damage to the bones likely resulted from shark predation or scavenging. Analysts applied the suite of traits indicative of shark-inflicted trauma described by Allaire et al., and determined that several of these traits were present on the remains — among them a set of parallel, incised bone gouges resulting from the spiraling action of a shark's teeth along the femoral shaft.¹ No teeth were retained in the sharp force defects, precluding a definitive diagnosis of shark species; however, based on the geographical location of the remains' discovery, the size and patterning of the shark-inflicted sharp-force damage, and the high torsional forces required to produce the damage, shark researchers from the FLMNH estimated that this distinctive pattern of trauma/damage was likely created by a bull or a tiger shark. It should be noted that analysts were unable to determine whether this shark activity constituted predation or scavenging, as all trauma/damage to the bone occurred while the bone was in a fresh or otherwise hydrated state.

This case study applies previous research on shark predation/scavenging to a case from the Florida coast with a distinctive taphonomic signature. It highlights the importance of communication and collaboration — not only within a single forensic anthropology laboratory but, perhaps even more importantly, with researchers from outside fields whose expertise may provide valuable insight into analyses of skeletal trauma and taphonomy.

Reference:

1. Allaire MT, Manhein MH, Burgess GH. Shark-inflicted trauma: A case study of unidentified remains recovered from the Gulf of Mexico. *J For Sci* 2012;57(6):1675-1678.

Shark Predation/Scavenging, Skeletal Trauma, Taphonomy