



## Physical Anthropology Section – 2003

### **H56 Unusual Sharp Force/Penetrating Trauma Pattern on a Cranium; Cooperative Examination and Evaluation by the Forensic Pathologist and Forensic Anthropologist**

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After attending this presentation, the participant will become familiar with a case with unusual sharp force/penetrating trauma patterns seen on a cranium and should have renewed respect for the value of combined pathology and anthropology examination of decomposed remains.

Background: The assessment of sharp force and penetrating trauma can at times be quite difficult. Yet, through the combined efforts of the forensic pathologist and anthropologist, sharp force and penetrating traumas can be located and correctly identified, and in many cases the type of weapon or tool utilized to inflict the trauma can be ascertained.

Case History: The severely decomposed partially clad body of a young adult female was discovered in a desert area of New Mexico approx. 2 ½ months after having disappeared. The cause of death was determined to be multiple stab/cutting wounds of the head, neck, chest and back. There were cutting injuries of the neck with probable transection of a carotid and other vessels, perforating stab wounds of the chest, abdomen, and back, some of which left clear impressions of a knife in cartilage, and cutting/stabbing wounds of the cranium some of which were sharp and others of which had characteristics of more blunt impacts.

Pathological/Anthropological Assessment: A total of 14 defects were present and noted on the cranium, located on the left temporal and left greater wing of the sphenoid. Combined evaluation of the skin and soft tissue defects along with the bone impacts and penetrations revealed at least two different instruments. Three of the defects were complete perforations of the cranium: measuring - 10mm x 5mm, 7mm x 3mm, and 6mm x 4mm. Radiating fractures connected two of the perforation defects. Ten defects had the appearance of "divots," running from posterior to anterior, indicating that the tip of the weapon was held at an angle or the trajectory of the blow was tangential to the surface the cranium. Of those "divots," four were partial penetrations of the crania with resultant displacement and hinged fracturing of the inner table. All of the "divots" had a characteristic width of 1.5mm. Several of the defects appeared to be perpendicular blows to the cranium, producing patterned marks reflecting the physical appearance of the tip of the weapon or tool. These defects had an oval outline, measuring 1.5mm x. 3mm. One small projection was observed on each side of the oval, but on opposite ends, projecting laterally, producing a pattern similar to a "hurricane" symbol. Though the exact type of weapon or tool utilized to make these defects is not known, it is hypothesized that these defects were produced with the tip of a pair of very small needle-nose pliers.

A more traditional sharp force trauma defect was observed with a 5mm cut of the superior margin of the left zygomatic arch, through the root of the zygomatic arch into the squamous of the temporal. A 3mm x 2mm triangular piece of metal was found lodged in the temporal squamous, possibly a knife tip. The cut sliver of zygomatic arch was still attached posteriorly to the arch at the time of examination. A smooth, single edged knife was the most likely weapon utilized to produce this defect.

Conclusions: Photographs of the wounds and suggested tool(s) were presented in court by both the pathologist and anthropologist and were instrumental in the jury's understanding of the wounds and how they were inflicted. Although the defendants who were convicted at trial did not confirm the specific instruments, circumstantial and associated evidence suggested that the interpretations of the wounding instruments were substantially correct.

**Sharp Force Trauma, Penetrating Trauma, Unusual Patterned Trauma**